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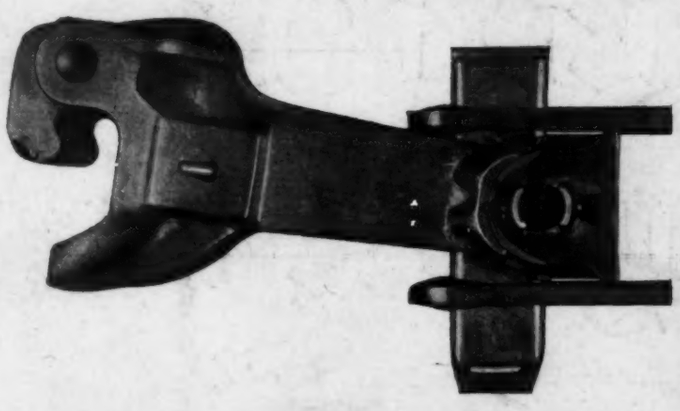

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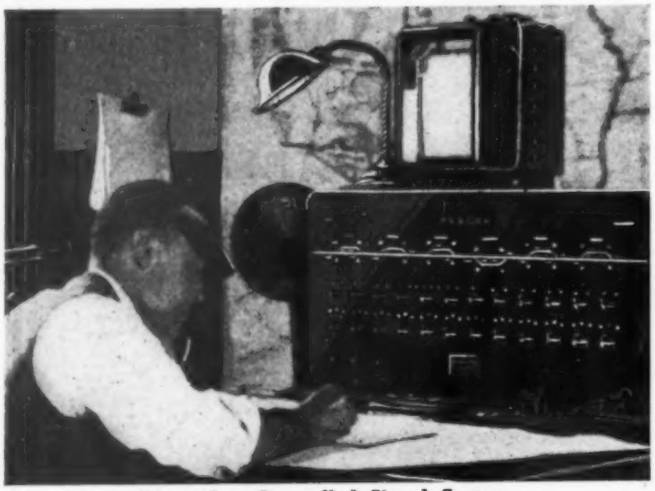

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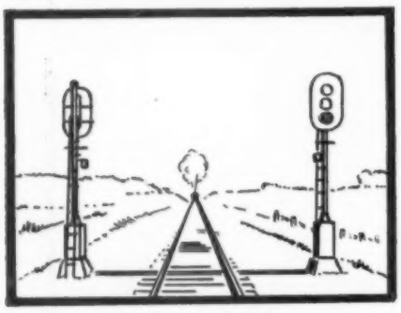

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Railway Age

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Tendencies and Prospects in the Railway Industry

By the Editor

A Year Neither Good Nor Bad

THE history of the railway year 1927 presents many contrasts to the history of the railway year 1926. It was not a bad year for the railways, but it was a less satisfactory one than 1926. In both years passenger business declined, operating efficiency increased and freight service was adequate and good. These are about the only respects in which the two years resembled each other. In 1926 freight business increased the most since the war and total earnings increased, while in 1927 both declined. In 1926 taxes increased and in 1927, for the first time in many years, they declined, but they did not decline as much in proportion as total earnings, and, in consequence, consumed more cents out of each dollar of total earnings than ever before.

In each year from 1921 to and including 1926 operating expenses either increased less in proportion than earnings or declined more in proportion than earnings, with a consequent steady reduction in the ratio of operating expenses to earnings. In 1927, owing mainly to the effect of advances in wages, expenses declined less in proportion than earnings and the ratio of expenses to earnings increased. The outcome was the first reduction in the net operating income earned by the railways as a whole that has occurred since 1921. The net operating income of the Class I roads was about $1,110,000,000. This was about $120,000,000 less than in 1926, and even $30,000,000 less than in 1925. The return on property investment was only about 4.5 per cent. This compares with 4.3 per cent in 1924; 4.9 per cent in 1925, and 5.1 per cent in 1926. The facts given show that the trends of earnings, expenses and net return in 1927 were different from and less encouraging than in other recent years, although the net return earned was larger than in any other year since the war excepting 1925 and 1926.

Looking Forward

IN spite of the necessity of facing such facts as those above stated, it is interesting and significant that most of the railway executives whose outlook is indicated by articles published elsewhere in this issue of the *Railway Age* express moderate optimism regarding the new year. They anticipate a freight business about as large as that of 1927. They believe capital expenditures on about the same scale as those of last year will be made. Their faith in the immediate future evidently is predicated upon the belief that underlying business conditions are sound and that the decline in freight business which began last summer, and in most territories became more marked as the year advanced, will not last long.

As to the soundness of underlying business conditions, their views coincide with those expressed by most leaders of industry, commerce and finance. The principal apprehension expressed is as regards the tendency of regulation. The executives of the granger lines are especially concerned about the possible use of the Hoch-Smith resolution as a reason for reducing freight rates on farm products.

Outlook for Earnings

THERE appears to be justification for the moderate optimism with which the future is generally regarded. At the same time, a statement made by the *Railway Age* in its issue for January 1, 1927, is equally apropos in this first issue of the year 1928. "It appears," we said then, "that if the total earnings of this year are not larger than those of last year most roads may have a hard time equalling the net return of last year." Very few roads did in 1927 equal their net return of 1926, and the same influences that caused the statement above quoted to be made a year ago are still operating. Advances in wages are still being sought, passenger business is still declining, and average revenue per ton per mile is still drifting downward.

If these influences are to continue to operate they must be offset by increases in freight business and in operating efficiency or the railways as a whole will fail again this year to equal the net returns earned in 1925 and 1926.

Operating Efficiency in 1927

THE efficiency of operation continued to increase last year. Average miles per car per day, average number of freight cars per train, average gross tons and net tons per train were greater than ever. Average speeds per train set another new high record. Coal consumption per 1,000 gross ton-miles again declined. There was a considerable reduction in passenger train miles and even a small reduction in passenger car miles, which, since 1922, have been increasing in spite of the decline in passenger business. Possibly the decline in passenger car miles was due to the fact that in 1927, for the first time in several years, travel in sleeping and parlor cars, as well as in day coaches, declined. This decline in travel in sleeping and parlor cars was one of the discouraging features of the year's railway business, but probably merely reflected the decline in business activity in general, and therefore does not seem likely to continue.

A large part of the capital expenditures of the railways within recent years have been made for improvements intended to reduce operating costs. The fact that total operating expenses were reduced only slightly last year, in spite of a substantial increase in operating efficiency, indicates that the principal effect of these improvements was to offset increases in wages. The experience of the year illustrates that under present railway conditions a very substantial increase in operating efficiency may not be sufficient to counterbalance a decline of traffic, decline of average rates and increases of average wages.

Record Installation of Automatic Block Signals

THE installation of automatic signals on 5,127 miles of road in 1927, along with 142 interlocking plants, represents an increase over the previous peak year of 1926. This continued activity in the signaling field can be accounted for by the fact that numerous roads, facing the necessity of handling increased traffic on faster schedules without corresponding increases in trackage, have installed automatic signals to reduce spacing between trains and have provided interlockings and remote power operation for outlying switches to eliminate train stops. Furthermore, much of the automatic signaling installed 20 years or more ago is now not only obsolete but so located as not to meet the requirements of modern methods of train operation, which involve increasing the average speed of trains by eliminating stops. Therefore, replacements, especially on multiple track lines, now represent a considerable proportion of the signaling work.

The same idea of eliminating train stops is responsible for the extensive installation of remote power-operated switches, automatic interlockings, spring switches, and other interlocking facilities at passing tracks, junctions, yard leads and crossings. Under modern operating conditions many of these installations at the less important points are now readily justified on the basis of facilitating train movements and reducing operating costs by releasing certain employees. Two large railroads recently agreed to co-operate in the installation of facilities at a number of crossings not heretofore protected. The entire cost will be about $30,000 and 75 train stops per day will be eliminated on each of the two roads.

Mechanical Department Work

RAILROAD mechanical departments contributed substantially to increased operating efficiency in 1927 by maintaining motive power and car equipment in condition to handle more gross ton-miles per train-hour. In fact, indications are increasingly numerous that mechanical officers appreciate to a greater extent than ever before the necessity of looking beyond the limits of their own department and organizing their work with a view to securing the best over-all operation. Based on available monthly fuel records for 1927, it is apparent that the railroads effected substantial economies in the use of locomotive fuel as compared with 1926, the fuel consumption per 1,000 gross ton-miles being less in each month than in the corresponding month in 1926, except in one case when it was equal. This gratifying performance was made possible by replacing a considerable number of obsolete locomotives with modern efficient power, by reassigning locomotives to runs for which they were better adapted, by still further extending locomotive runs, and by giving close attention to all of the numerous other factors affecting locomotive fuel performance.

There was unusual activity during the last year in the development of locomotive improvements, the tendency in locomotive design being to experiment still further with steam pressures up to 400 lb. in this country and even higher pressures abroad. Larger grate areas and firebox volumes, made possible by the use of the four-wheel trailing truck, were installed, and the entire design developed with the dual object of fuel economy and high maintained horsepower output at speeds. Tests of Diesel engine-driven locomotives were continued, and an increased interest shown in rail motor cars arranged to burn gasoline, distillate, or Diesel fuel oil and replace unprofitable steam train operation for certain branch and local main line traffic.

The past year witnessed further successful attempts to secure increased utilization of freight cars by heavier loading, reduction of transfers and reduction of hot boxes. A standard refrigerator car design was developed which will in all probability be approved with minor alterations by the A. R. A., Mechanical Division. Experiments with roller bearings in passenger train service were continued on a fairly large scale by two systems, with a number of other roads making more limited tests to determine the advantages of this type of bearing in reducing the starting power required, increas-

ing the smoothness of train handling, effecting fuel economy and securing possibly other desirable results.

Another Big Year For Roadway

THE year that has just closed was the most active from the standpoint of the roadway department in more than a decade, measured by capital expenditures and also by those for maintenance, in spite of the fact that the mileages of new lines and of multiple main tracks completed show decreases as compared with the year previous. The fact that a greater mileage of new lines is now under construction than was completed last year, and the further fact that the rail orders placed late in 1927 for delivery during the early months of this year are slightly larger than those of a year ago, indicate that the managements of the railways expect to continue to improve roadway and other permanent structures this year on about the same scale as last year.

The liberal expenditures which have been made upon these parts of the properties have contributed largely to the improvement in operating results. Increased regularity of service and heavier train loads are made possible in no small measure by the elimination of congestion and by stronger track construction. A trend of outstanding prominence during the last year was the rapidly increasing use of rail of heavier sections, supplemented by the more liberal use of ballast. Likewise, bridges have been strengthened to permit the operation of heavier power on many lines. The result of all that has been done is that the roadway and structures are now in the best condition they have ever been and are better prepared than ever before to carry a heavy traffic safely, expeditiously and economically.

The Division of Capital Expenditures

THERE was much complaint from builders of locomotives and cars, especially the latter, last year because of the comparatively small orders received by them from the railways. Statistics regarding locomotives and cars installed include those for both new and rebuilt equipment. In the first ten months of the year the number of locomotives installed in service was 1,671, as compared with 1,839 in the corresponding part of 1926; 1,486 in the corresponding part of 1925, and 1,770 in the corresponding months of 1924. Installations of locomotives were, therefore, about the same as the average for the three preceding years. The number of freight cars placed in service in the first ten months of 1927 was 62,225. The figures for the corresponding ten months of the preceding three years are as follows: 1924, 129,942; 1925, 117,075; 1926, 87,061, an average of 111,359. Installations of freight cars in the first ten months of the year were, therefore, about 43 per cent less than the average for the corresponding parts of the three preceding years.

While there was a substantial decline in expenditures for equipment, especially for freight cars, there was not a corresponding decline in total capital expenditures. The reason was that capital expenditures on roadway and structures actually showed an increase in the first nine months of the year, and may have been larger in the entire year than in 1926. In the first nine months of 1927 they exceeded 365 million dollars, as compared with 358 million dollars in the first nine months of 1926. The general tendency to increase expenditures on roadway and structures, as compared with those for equipment, has prevailed for some years. In 1923 expenditures on roadway and structures were 36 per cent of total capital expenditures; in 1924, 44 per cent; in 1925, 55 per cent; in 1926, 57 per cent, and in the first nine months of 1927 about 64 per cent. The same tendency has prevailed in maintenance expenditures, those for the maintenance of equipment having shown a decline in the first ten months of the year, while those for maintenance of way and structures showed an increase.

The railway equipment and supply manufacturing industry is roughly divisible into concerns that build equipment and make equipment specialities, and concerns that make devices and materials used in tracks and other permanent structures. The capital expenditures and maintenance policies of the railways within recent years have caused a wide difference in the degrees of prosperity—or adversity—of the two large classes of manufacturers for which they afford a market.

There always have been wide fluctuations from year to year in railway purchases of equipment. These fluctuations have been relatively much greater than fluctuations in traffic. It has often happened that equipment purchases have been largely reduced just before an increase of traffic and largely increased just before a decline of traffic. The explanation is that purchases of equipment usually have increased when net earnings have been relatively large and declined when net earnings have been relatively small. It is a notable fact that in both 1925 and 1926 this was not the case—that in both these years traffic and net earnings increased while purchases of freight cars declined. They declined again in 1927 when earnings declined.

Equipment Conditions in 1928

THE principal reason for the decline in purchases of freight cars has been the unbroken prevalence of freight car surpluses for four and one-half years. The surplus supply of cars, if there is any, always reaches its minimum in the fall. The smallest net surplus reported in 1923 was about 10,000; in 1924, 93,000; in 1925, 103,000; in 1926, 78,000, and in 1927, 135,000. The continuance of the car surplus, and its comparatively large size at the peak of business in 1927, in spite of small purchases of freight cars within recent years, has been mainly due to the increased efficiency in the use of cars which has been shown by the steady increase in average miles per car per day. The unusual size of the

car surplus in the fall of 1927 was, however, also largely due to the failure of freight business to show a normal seasonal increase.

Probable Trend of Traffic

PAST experince and existing business conditions seem to warrant the expectation that freight business in the early months of 1928 will be less than in the early months of 1927. The same experience and conditions also warrant the expectation that, if farm crops should be normal, there will be a substantial increase of freight business in the latter half of 1928. In the latter part of 1923 freight business showed the same declining tendency that it has shown within recent months. In the latter part of 1924, it began to increase and became larger than in the latter part of 1923. From then on it increased steadily and set new high records in both 1925 and 1926.

General business has fluctuated less and moved in shorter cycles since the war than it did before. No doubt this has been due to the general practice of carrying smaller inventories and "buying from hand to mouth," as a result of which changes in the volume of production of materials and commodities follow changes in their actual consumption much more closely than formerly. Evidence of a decline within recent months of purchases of consumable commodities has been afforded by statistics of railway car loadings, but if underlying business conditions are sound, as practically all authorities agree, it will not be long until there is a reversal of this tendency.

One encouraging feature of the situation is that the purchasing power of the farmers has been increased by the advances in the prices of their products, and in consequence there is hope of an increase in the traffic of the railways in agricultural territory, especially in the northwest.

The Movement of Coal

ANOTHER factor of great importance is that of coal shipments. In the latter part of 1926 and the early part of 1927 these shipments exceeded all previous records because of the prospect of a coal strike, and unprecedented storage supplies of coal were accumulated. On the other hand, within recent months coal shipments have been relatively small. From the beginning of 1927 to December 10 they were 50 million tons less than up to the same date in 1926. In the week ended December 10, 1926, they exceeded 14 million tons, while in the week ended December 10, 1927, they were less than 9,700,000 tons, or 30 per cent less. If past experience is any criterion they will continue to be less in the early months of 1928 than in the corresponding part of 1927, with the result that there will be a big increase in coal shipments in the latter part of the year.

Even at this early date, therefore, it seems reasonably safe to predict that 1928 will be an "old fashioned" year in one important respect—in other words, that the peak traffic next fall will be much larger than the average traffic of the early months of the year. If the railways are to be prepared to render service satisfactory to the public they must be ready to handle the peak traffic satisfactorily. Will they be able to do so in 1928 without buying more new freight cars than in 1926 or 1927? This is a question which, of course, cannot be answered now. Railway executives are unanimous in anticipating that freight service in 1928 will be adequate. At the same time, there is some indication that one means that they intend to adopt to insure its adequacy is that of increasing their purchases of new freight cars.

High Prices of Securities

ONE of the features of last year's railway history was the continued advance in the market prices of railway securities in spite of the decline in net operating income. The decline in net began in April, when the average price of 20 representative railway stocks on the New York Stock Exchange was about $110 a share. It continued to decline month after month, and yet on October 5 the average price of the same stocks was almost $123, and in December was still more than $121, as compared with less than $103 on the same date in 1926. This advance in security prices was due principally to two causes. Average net income per share of all railway stock in 1926 was $9.44. The previous highest record figures were $8.40 in 1916 and $8.19 in 1925. The increase in net income per share was followed by advances in the dividend rates of a good many roads, leading to the expectation that increases in dividends would be made by many others.

A factor of even greater influence, perhaps, was the continuance of low interest rates owing to the abundance of capital seeking investment, in consequence of which security prices in general advanced in the teeth of what was called "profitless prosperity" in numerous lines of business. The prevailing low interest rates and high security prices afford such an opportunity as has not existed in many years for refinancing and new financing, especially by the sale of stock. Numerous railways have taken more or less advantage of the opportunity by refunding indebtedness at lower rates of interest or issuing new bonds or selling stock.

The increase in the amount of railway stock outstanding and the decline in total net operating income undoubtedly caused a substantial decrease in average net income per share of railway stock in 1927. Probably when complete figures are available they will show net income per share was substantially less than in 1926, or even in 1925. And yet at the end of the year the average price of 20 representative railway stocks was $24 a share greater, or about 25 per cent higher, than at the end of 1925.

The trend of stock market prices would have been quite different, no doubt, if the reduction in the net return earned by the railways had not been accompanied by an actual decline in interest rates.

Trend of Regulation

THE tendency of the stock market in 1927 to ignore not only current earnings, but developments of even greater importance, was illustrated by the way it practically ignored some of the most significant decisions ever rendered by the Interstate Commerce Commission. Most students of railway affairs expected that when the commission announced the principles it believed should be applied and the methods used in making final valuations it would give substantial weight to the difference between the costs actually incurred in the construction and development of the railways and what it would cost to reproduce them at post-war prices and wages. This the commission, in its decision in the O'Fallon case last spring, definitely declined to do, and declared itself in favor of principles and methods the adoption of which would make the aggregate valuation substantially less than the investment in property reported in the carriers' accounts. As a result the entire question of valuation must be fought out in the courts. There will be years of litigation, and it seems likely that, until the entire question is settled, the commission, whether avowedly or not, will use the basis it favors in measuring the fairness and adequacy of the net return earned. In addition, the commission rendered decisions in certain cases interpreting and applying the Hoch-Smith resolution, which have caused apprehension among railway executives, especially among the executives of roads a large or major part of whose freight business consists of agricultural products.

Attention often has been called to the fact that even on the basis of the tentative valuation made by the commission itself, plus subsequent investments, the railways as a whole have never earned, excepting in 1926, a year of record-breaking freight business, approximately the 5¾ per cent that it has held would be fair, and misgivings have been expressed as to what would be the effect of a substantial decline in traffic. That these misgivings have not been unwarranted has been shown by the experience of 1927. That stock market prices have continued to advance in spite of such developments as have been mentioned seems to show that the abundance of capital seeking investment has so completely dominated the market that not only current earnings but also the trend of regulatory policy have been practically disregarded.

Public Sentiment Favorable

WHEN general conditions and public sentiment at the beginning of the new year are considered the trend of regulation seems to be a result of past rather than present conditions and sentiment. When the Hoch-Smith resolution was passed there was a marked disparity between the prices of farm products and of other commodities, but as a result of recent readjustments the pre-war parity between farm and other prices has been virtually re-established. Last year was singularly free from manifestations of unfriendly public sentiment toward the railways. An interesting event was the Baltimore & Ohio's "Fair of the Iron Horse" in celebration of the 100th centenary of the granting of its charter. The attendance, and the interest shown by people of all ages and classes in the exhibit and pageant, completely surpassed the most optimistic expectations of the Baltimore & Ohio's officers. It is undoubtedly a fact that the American public is now more friendly toward the railways, more keenly alive to the value of good railway service, and more favorable to regulation assuring opportunity for continuance of the development and improvement of railway facilities and service, than it has been for many years.

Future Railway Policy

THE policy that past developments, present conditions and future prospects seem to suggest to railway managements is that which the attitude and utterances of chief executives indicate that they intend to follow. This is the policy of going forward with the program for improving physical properties, operating methods and service which was adopted almost five years ago, and which thus far has been carried out with great courage, skill and success. Recent tendencies of traffic, of operating expenses and of regulation have not been satisfactory; but no doubt traffic will soon increase again, and it may be hoped that regulation will become more favorable. Decisions of the Interstate Commerce Commission regarding valuation and rate-making are subject to review by the courts, which may be helpful; general business conditions seem to be sound; relations with both employees and the public are unusually satisfactory, and, therefore, the moderate optimism that railway executives express seems to be well founded.

Railway Prospects in 1928

Chief executives of large systems in all parts of country express optimism regarding traffic—Capital expenditures will not change much—Revenue needs of Western roads emphasized

IN spite of the recent decline of traffic and earnings, railway executives throughout the country express moderate optimism regarding the traffic prospects of 1928. The views expressed by them indicate a consensus of opinion that railway facilities will be adequate for the demands made upon them, and that, at the same time, capital expenditures for enlargements and improvements comparable with those in recent years will be continued.

Moderate Optimism Expressed

The principal note of pessimism in the views expressed is to be found in the utterances of executives of central western and northwestern roads, who emphasize the need of larger revenues for most railways in these territories, and some of whom regard with apprehension possible regulations under the Hoch-Smith resolution making reductions in rates on farm products which cannot be adequately offset by advances in rates on other commodities.

Replies to Questionnaire

The following questionnaire was sent recently by the *Railway Age* to the presidents of the larger railway systems in each part of the country:

"During the year 1927 railway freight business, passenger business and net operating income have declined in most parts of the country. There has also been a decline in the amount of equipment bought by the railways. There is, therefore, unusual interest in the views of railway executives as to the prospects for the year 1928.

1928 Traffic Prospects

"1—Do conditions in the territory served by your railway indicate a freight business of larger or smaller volume than that handled in 1927?

Capital Expenditures

"2—Will the capital expenditures of the railways probably be relatively as large in 1928 as within recent years? Since 1923, on most roads, capital expenditures for the improvement of roadway and structures have increased in proportion to those made for new equipment. Meantime the efficiency of the use of equipment has increased and there have been no shortages of transportation. Will there be danger of a shortage of equipment if purchases of equipment are not increased?

Effects of Tendencies of Regulation

"3—Large amounts of capital have been invested in expanding and improving railway facilities during the last five years although, as an annual average, the railways have not earned what the Interstate Commerce Commission has held would be a fair return under the provisions of the Transportation Act. Are there tendencies in present regulation which raise a question as to whether it will be practicable for the railways to continue to go forward with programs of capital expenditures that will assure their ability to render in future as good and adequate service as they have rendered within recent years?"

Most of the articles published below are in direct response to this questionnaire.

The Railroads in 1928

By R. H. Aishton

President, American Railway Association

TWO of your three inquiries with respect to the prospective railroad situation are doubtless intended for executives on individual properties who have the responsibility of determining policies, with such determination the American Railway Association has nothing to do.

Your third inquiry involves the perennial question of business forecasting. I am not a business prophet.

I can say, however, that the work of the American Railway Association, especially through its Car Service Division, keeps in touch more or less directly with business activity in almost all lines and in all parts of the country. Through the information secured by this division by means of the Regional Advisory Board committees, or from other sources, we are apprised of changes either upward or downward in the demand for transportation service. It is generally recognized that the changes in demand for transportation service reflect with considerable accuracy the general business changes. Forecasts are made quarterly on the basis of information derived from the board committees, but do not at all attempt to forecast longer swings of business. No such forecasts reported at this time are projected into 1928.

We could not fail to note, however, certain general facts known to everyone who has given attention to general business conditions, such as—

1. An ample supply of available capital at low interest rates.
2. The recently rising trend of general wholesale prices.
3. The absence of accumulated inventories.
4. The betterment in the agricultural situation, with increasing purchasing power in that field.
5. The growing tendency of industries to co-operate more fully within each industry and with other industries.
6. Continued improvement abroad.
7. Generally sound economic conditions in this country.
8. Adequate and efficient transportation service.

This is not the stuff that despondency, or gloom, or pessimism is made of.

Railway managements are co-operating heartily through the medium of this association in a concerted effort to achieve better and better transportation effi-

ciency records. This will be true in 1928 and will insure one important contribution to general economic welfare, namely, adequate, dependable, expedited and efficient transportation service.

We have not failed to note, and with great satisfaction, a continuation of the more sympathetic and understanding attitude toward railroad problems on the part of the shippers and the general public. It is our belief that this will continue during the coming year.

It has seemed also that co-operation with federal and state regulatory authorities has tended to bring about a more friendly attitude and a clearer mutual understanding of common problems. This factor also should carry over into 1928. There is evidence, too, that Congress has more and more been assuming a constructive attitude in legislative action with reference to the railroads. It is hoped and believed that this will carry on through 1928.

It may be said, therefore, in a word, that the railroads of the country will contribute their share to economic welfare in the form of the most efficient transportation service that can be offered.

Railroad Prospects Are Good

By P. E. Crowley

President, New York Central Lines

THE close of the year 1927 marks the ending of another year of prosperity for the country. The situation as to the railroads appears to be satisfactory, from a business point of view. They have handled, during the year, enormous amounts of traffic and have handled it expeditiously and efficiently. The physical condition of the roads is, as a whole, good; the roadbeds are well maintained, the rolling stock is kept up to a high standard of efficiency, and the railroad forces are performing their work in a satisfactory manner.

The cordial co-operation which exists between the shipping public and the railroads has resulted in a more prompt loading of cars by shippers, more prompt unloading by consignees, and has kept freight cars more constantly in motion. Car shortages, which at one time in railroad history were frequent and serious, have practically disappeared; and with the continuance of the conditions as to high standards of maintenance and as to cordial relations between the roads and their customers, the roads will furnish as good and adequate service during the coming year as they have furnished during the year that is now closing.

No reason seems to exist to cause us to anticipate a serious lessening of traffic. Soft spots have appeared here and there in the business world, but they are not of such magnitude as to cause apprehension for the coming year.

The continued prosperity of the country and the increasing credit of the railroads as a whole make railroad financing a less difficult problem than it was some years ago. If additional financing for individual roads becomes necessary during the year on account of additions and betterments, or retirement of old security issues, or for other reasons, I do not anticipate they will find it difficult to obtain what money is needed on reasonable terms.

Expenditures for equipment, materials and supplies during 1928 should be normal if the expectation of continuing business is well founded.

Railroad consolidations have made small progress during the year and it is not reasonable to expect that greater progress will be made until the present law is changed in such a way as to permit a practical solution of the problems which exist, and which cannot be solved under the present law.

I look for a prosperous year for the railroads and for business in general.

Northwestern Roads Need Better Earnings

By Charles Donnelly,

President, Northern Pacific Railway

1. CONDITIONS in the territory served by the Northern Pacific indicate a slightly greater volume of freight business for the first six months of 1928 than was handled in the same period in 1927, due to comparatively good crop in the fall of 1927. The volume of traffic to be moved in the last six months of 1928 will depend largely on crop conditions.

2. Capital expenditures on the Northern Pacific in 1928 will probably be on a level with similar expenditures in recent years.

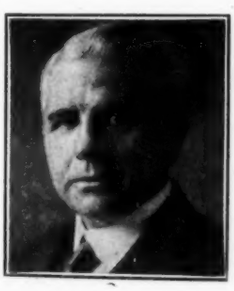
3. The credit of northwestern railways cannot be indefinitely maintained unless their earnings reflect substantial improvement.

Traffic Prospects Favorable

By C. R. Gray

President, Union Pacific System

1. CROPS of all kinds in the states traversed by the Union Pacific have been very good this year, and I therefore look for a better volume of freight traffic during the first six months of 1928 than for the corresponding period of 1927. Passenger traffic should be about the same.



The Union Pacific depends very largely upon agriculture, and it is not safe to prophesy at this time for the last six months of 1928. We will have to wait until the crop conditions for that year are known. So far, however, moisture conditions are good and fall-sown wheat is making favorable progress.

2. The capital expenditure program on the Union Pacific for next year will be about the same as for this year. There will be no unusual items except the construction of an extension to connect the west end of the North Platte Branch with the main line in the vicinity of Hillsdale, in eastern Wyoming, a distance of about

54 miles, at a cost of about $2,400,000. This extension will provide more convenient access to the fertile North Platte Valley for coal, lumber, livestock and limestone moving in from the west.

There was sufficient equipment to handle the traffic this year and I do not look for any substantial purchases except to take care of retirements, and as heavier power is being purchased than retired, this will make some increase in motive power capacity.

3. So far governmental regulation has not restricted capital expenditures to the extent of impairing the ability of the railroads to render adequate service. While there are always tendencies towards more restrictive regulations, yet I am hopeful that the general situation in this respect is such that the legislative bodies will not permit undue restrictions.

Southwest Business Prospects Good

By J. E. Gorman,

President, Chicago, Rock Island & Pacific Railway

1. IT is our opinion that the outlook for the year 1928, from a freight traffic standpoint, is very bright. While we cannot look forward to as heavy an oil movement in 1928 as experienced in 1927, due to a natural slump in production in the Greater Seminole fields, still we can look for a fairly substantial movement, not only from that field but possibly from the Amarillo Panhandle field. Indications are that production in Greater Seminole field will by January, 1928, slump to 300,000 bbls. a day, compared with peak production on July 30, 1927, of 527,000 bbls. per day. The decline in Greater Seminole field will probably stimulate production in other fields—particularly Texas Panhandle fields, but we do not anticipate that any improvement in the latter field will offset altogether the slump that has been sustained in production at Greater Seminole field.

We will count largely upon a good winter wheat crop in Nebraska, Kansas, Oklahoma and Texas. The present outlook is very favorable—the acreage planted in these four state this fall showing an increase of 1,714,000 acres, or 7½ per cent, compared with last year's planting, and anticipated production of winter wheat for the four states is estimated at 286,342,000 bushels—which is greatly in excess of the five-year average figures of 1922 to 1926 of 224,780,000 bushels.

The outlook for movement of manufactured commodities is bright. During 1927 unusual conditions in the automobile industry had a depressing effect upon other industries, and present prospects are that 1928 will show a decided improvement, not only in the automobile but in other manufacturing industries largely dependent thereon—so we anticipate a very substantial movement of manufactured commodities next year.

Generally speaking, in the territory served by our rails, we are assured of a normal corn crop, which is also a big factor in our welfare.

Taking into consideration the bright outlook for a substantial winter wheat crop, improved conditions in the automobile and other manufacturing industries, and a normal corn crop, it is my opinion that we should do as well during 1928 as in 1927, if not a little better.

2. The capital expenditure of the railways will be relatively as great in 1928 as in the past few years. It is not expected there will be any danger of an equipment shortage next year, but it is expected the railroads will purchase additional equipment in 1928 required for specific commodities, such as stock and coal cars, and, of course, the railroads must keep abreast in their equipment conditions by purchasing an equal freight car capacity as they retire annually; therefore, if no new equipment is purchased, and the railroads continue to retire equipment as it becomes obsolete, in time some shortage would result.

3. While it is true large amounts of capital have been invested in expanding and improving railway facilities during the last five years, although the railways have not earned what the Interstate Commerce Commission has held would be a fair return under the provisions of the Transportation Act, these improvements have resulted in more economical and efficient operation, and as long as improvements can be provided which will effect savings sufficient to warrant the expenditure, it is practical for the railroads to continue to proceed with programs of capital expenditure that will assure their ability to render, in the future, as good and adequate service as they have rendered in recent years.

Continued Improvement Necessary to Good Service

By E. J. Pearson

President, New York, New Haven & Hartford Railroad

1. FROM the present outlook it is believed the volume of freight traffic on the New Haven System in 1928 will be approximately the same as in 1927.

2. The heavy expenditures since 1917 for improvements in plant and equipment have placed the New Haven in better condition than for many years, and in position to handle a considerable increase over the large volume of traffic of the last few years. The capital expenditures for 1928 will be substantially the same as in the past two or three years. Study recently made by the American Railway Association indicates that unless there should be an abnormally large volume of traffic in 1928, which seems unlikely, there should be no danger of an equipment shortage. There are, however, signs that in some respects transportation capacity of the railroads as a whole is in danger of becoming crowded, and that if the generally high character of service of the past few years is to be continued, careful attention must be given to the development and provision of increased facilities to adequately care for future growth of traffic.

3. A continuation of the disturbing tendency of the past few years toward decreases in freight rates, as indicated by the downward trend of revenue per ton-mile, will seriously hamper the railroads in carrying out the further programs of expansion necessary to insure continuance of the good and adequate service in the recent past. A clear responsibility rests upon the Interstate Commerce Commission and the railroads for scientific adjustment of rate schedules to the end that they will

be equitable for all classes of traffic and produce revenues sufficient to maintain a sound condition of railroad credit, without which the funds for necessary expansion of facilities cannot be provided.

Hope for Reasonable Rate Readjustments

By Fred W. Sargent

President, Chicago & North Western Railway

1. PRESENT indications are that railway freight traffic in 1928 will correspond in volume favorably with 1927.

2. Our capital expenditures will be relatively as large in 1928 as in recent years. I do not believe there is danger of any shortage in equipment.

3. This latter statement is based on the assumption that the Interstate Commerce Commission will co-operate with the carriers along the lines of establishing and maintaining reasonable rates. Certain recent decisions of the commission are somewhat discouraging, but I cannot yet believe that the commission intends the full purport of what has been said with relation to reducing rates as rapidly as the financial condition of the carriers improves. Indeed, I have faith to believe that the commission will, before the expiration of many more months, bring about readjustments that will be beneficial to the carriers without in any manner placing a hardship on the shipping public.

Prospects in Pocahontas Territory

By A. C. Needles

President, Norfolk & Western Railway

1. IN view of the present slowing up in the production of coal, which will likely extend into next year, and with the prospect of a reduced movement of lake cargo coal from our line next year as a result of recent adverse decision of the Interstate Commerce Commission respecting lake cargo coal rates from our section, I anticipate some decrease in our total business and gross revenues in 1928 as compared with 1927, though this will be offset to some extent by other traffic, which continues to move in good volume, reflecting the increasing development of this part of the country.

2. In my opinion, railway capital expenditures during 1928 will be less than during 1927. The Norfolk & Western does not contemplate making any large capital expenditures in 1928, though we will continue our program of keeping the property and equipment in first class condition.

Western Roads Anxious About Hoch-Smith Resolution

By Hale Holden

President, Chicago, Burlington & Quincy Railroad

1. CONDITIONS in the territory served by the Burlington Route indicate insofar as they are now discernible that the volume of freight business in 1928 will likely not vary greatly from that handled in 1927. Crop results always present the principal question to a line serving an agricultural territory, and any prediction of this character is based upon the assumption that we shall have normal crops; in addition another assumption must be made, and that is there will not again next year be a suspension in coal mining in this territory as there was for six months during 1927. The good crops this year over most of our territory have brought a great deal of new money to the agricultural population, which has bettered conditions in many directions and with continued easy money conditions I believe the prospects for next year justify the prediction of a normal year in freight business.

2. Without noticeable increase in the volume of freight traffic and with continued decline in passenger traffic and steady encroachment upon both forms of traffic by motor vehicles, as well as by increased movement over waterways, there seems little ground to predict more than normal capital expenditures in 1928, and these will, in my opinion, be restricted in the main to replacements of equipment used up, some heavier power for the sake of economy, and mechanical improvements to reduce costs of operation. At the present time the middle western railroads have obviously a capacity to handle a considerable increase in volume without material increase in trackage or yard capacity if such increase in volume should develop. Constant increases in speed of both freight and passenger trains have been calling for increased expenditures in roadway structures and work of this character will doubtless continue along normal lines.

I do not believe there is any great danger in the near future in this territory of a shortage of equipment, provided the existing supply is maintained, because the railroads have long since demonstrated by improved methods not only of handling enroute and through terminals, but also by co-operation of the shippers and among themselves, that they are well equipped to handle any volume of freight business that is probable during the coming year.

3. The railroads in the central west have not been permitted to earn since the end of federal control a fair return even upon the low valuation which the Commission is committed to, and without a substantial increase in the volume of business, which I have before stated is not apparent, there seems no basis under which they can be expected to earn a fair return under present rates.

Considering the enormous losses in passenger revenues, and with passenger train mileage showing little if any decrease, passenger revenue losses have been almost entirely at the expense of net earnings. These net losses would have been exceedingly grave in character had it not been for the remarkable progress in economy of operation which railroad management has been able to

produce, but there is a limit to these economies and it is probable that most of them have been availed of. So far as this territory is concerned, the tendencies of modern regulation to not only deny any increases in rates to railroads in this territory, but to continually reduce existing rates, must in time restrict capital expenditures and further development, particularly if we are to develop another competing transportation system upon inland waterways to further divide the existing traffic with the railroads and motor vehicles.

The most ominous tendency confronting western roads aside from continued wage increases and rate reductions, is the administration by the commission of the Hoch-Smith resolution, if in carrying out the terms of that resolution the commission should undertake to further reduce the rates on agricultural and livestock products and other low grade commodities, because in western territory there is no sufficient volume of other traffic to anywhere near make up the losses in revenue which would result from action of that character. Western roads are awaiting with much anxiety the action of the commission under this resolution.

Outlook for 1928 Quite Satisfactory in Every Direction

By W. B. Storey,

President, Atchison, Topeka & Santa Fe Railway

THE year now closing has presented no outstanding features so far as the Santa Fe Railway and its territory are concerned. From an agricultural standpoint the major crops, consisting of wheat, corn oats, hay, the sorghums, cotton, citrus fruits, and grapes, averaged up satisfactorily and prices have been fair. The live stock industry has showed improvement compared with recent years. Manufacturing and mining have been carried on at a fair percentage of capacity. Due to continued over-production of oil this industry has been showing rather a poor return and development activities have been restricted. There has been rather less building this year than last and the lumber companies have not made large earnings, although their production has been fairly large. Bank failures have been fewer than in the last few years and some institutions which were in a precarious condition the early part of the year now seem to have reached a position of safety.

The Santa Fe has been engaged in only minor construction projects, completing the line from Pawhuska to Ralston, Oklahoma, 30 miles, and the White Deer Branch in the Texas Panhandle, 11 miles. Some 116 miles of second track have been added and 575 miles of 110 lb. rail have been laid on main lines in lieu of lighter rail. Fortunately no great damage from floods, such as occurred in the lower Mississippi Valley, affected any of our territory, although our roadway did suffer somewhat from floods in Kansas and in southern California; but the general benefit to the latter state from the ample water supply is abundant compensation for the damage.

The outlook for 1928 is quite satisfactory in every direction. There is a reasonable feeling of optimism among the citizens of our territory, although no boom anywhere is anticipated. The Santa Fe railroad plant is in first-class condition and will be kept so. About the usual program of improvements and additions to equipment, roadway, and structures is now contemplated as it is our policy to work along a fairly even program in order that we may always be prepared for any traffic demands which may be made upon us.

A Virtual Revolution in Railway Transportation

By J. R. Kenly

President, Atlantic Coast Line Railroad

1. FROM all present indications traffic in the Southeast during 1928 will not be greatly different in volume or in character from that which has been handled by the carriers during the past year. While there is a natural variation in different sections conditions are generally sound, and there is reason to believe there will be a further gradual improvement as time progresses.

2. Capital expenditures of the railways in this section during 1928 will probably not be as large as within recent years. Many of the roads in the Southeast have, in the past few years, made very large capital expenditures for extending and improving their transportation plants. Increased efficiency in operating methods has also tended further to increase the capacity of the transportation plants. Most of these plants are not now being used to capacity and can handle a materially heavier traffic than at present. There seem to be reasons to believe that the roads have on hand ample equipment to handle any traffic that may be anticipated for 1928.

3. The large capital expenditures for improved facilities and additional equipment, together with improved operating methods, have wrought a virtual revolution in rail transportation during the past few years, and have made it possible for the railroads to render the best service in their history. This fact is recognized not only by economists and railroad men but by business experts the country over. Even with the high standards of service that have been attained, however, there is a constant and insistent demand by the public for further improvements. It is clear that the public will never again be satisfied with anything but the very best transportation service.

At the same time, there are constant demands for reductions in freight rates. In the majority of cases these demands are granted by the regulatory agencies, with the result that the revenues of the carriers are being constantly whittled down.

There must, in my opinion, be a more general recognition by the regulatory bodies that an adequate transportation system cannot be maintained unless the railroads are permitted to earn large enough returns upon the money required to supply the transportation plant to attract new supplies of capital that they must have.

Capital Expenditures Will Be Normal

By W. R. Cole

President, Louisville & Nashville Railroad

1. IN my opinion the railway traffic as a whole for 1928, particularly in the south, will compare favorably with that of 1927. The operating reports and balance sheets may perhaps suffer somewhat by comparison with recent past years, but I believe it will be largely because they were periods of record-breaking performance. With few exceptions the traffic of this company, and I believe that of the other railroads in the south generally, has been holding up fairly well, and there are at present no definite indications of any approaching decline that would cause serious alarm.

2. I have no information regarding the amount of capital expenditures other railroads contemplate making for new improvements during the coming year, but I may say that the expenditures of the Louisville & Nashville for new equipment, materials and supplies, including new rail, will be about normal. The railroads, as has been fully demonstrated by their splendid efficiency in the past few years, are well equipped satisfactorily to handle the existing commerce, but there is of course a constant necessity for constructing new improvements and making refinements in the existing plant, along with current replacements, in order to promote even greater efficiency and more economical operation. Expenditures for this class of work will likely go on about as usual, and distribution, similarly as in the past few years, of these expenditures as between equipment and roadway projects will doubtless continue.

Problem of Fair Regulation Must Be Met

By H. E. Byram

Receiver, Chicago, Milwaukee & St. Paul Railway

1. AGRICULTURAL products form the basis for producing tonnage for the railroads in the territory in which our line is located, and the gross production of agricultural products in that section this year has been larger than usual. Therefore, we look forward to handling more agricultural products during the winter months. As to the full year of 1928: There is nothing at this time on which to base a calculation that would be of any value, although there does not seem to be any indication just now of a material change in the volume of traffic.

2. I do not know how to intelligently answer the first part of your question No. 2. It would require a knowledge of the conditions on the different railroads in the country which it would be impossible for anyone to have. I do not think there is any danger of a shortage of equipment in the immediate future. There has been a surplus of equipment this year in the west, although the movement was heavier than usual. Of course, equipment retired or destroyed will have to be replaced, but there does not seem to be any urgent need for a large increase in the purchase of equipment to take care of the business that is in sight at the present time.

3. I think there are decided tendencies in the present situation, both as to the regulation of railroad rates and the fixing of railroad employees, wages by arbitration, which must ultimately be reflected in the ability of the railroads to obtain the capital necessary to make the improvements that are necessary on the railroads in order to maintain their efficiency and permit them to furnish adequate service to the public. This is a problem which will have to be met some time if the railroads are to remain in private ownership and produce net earnings sufficient to justify the investment by the public of the large sums that are necessary for this purpose.

The Tendency Toward Inadequate Valuations

By Ralph Budd,

President, Great Northern Railway

1. THE 1927 crop was much better in our territory than the 1926 crop, and as a result the farm income in Great Northern territory nearly doubled this year, compared with last. No forecast of northwest crops is of any value at this time of year, because seeding is done almost wholly in the spring. It can only be said now that the ground is in good condition, the past season having been above normal in precipitation, and the snowfall this winter has been heavier than usual. The crop producing area is being enlarged, diversification is making further progress every season, and if next season's yield is good, traffic in agricultural products undoubtedly will be heavier than in 1927 because there will be more of the 1927 crop left to handle during the first few months of 1928 than was handled during the corresponding months of 1927.

2. Great Northern will expend for additions and betterments in 1928 about the same as for the past few years. The road is in splendid physical condition and well equipped. It has a capacity for moving traffic greatly in excess of requirements. For this reason, after the year 1928, when the very large expenditures for rebuilding the line over the Cascade Mountains and electrifying that division are completed, our capital expenditures should be somewhat less for the next few years, except for the building of new branches to take care of territory that is developing.

3. There seems to be a tendency to allow inadequate valuation upon which to reckon the rate of return and to assume that the entire public interest is in having lower rates. Enough weight does not seem to be given to the importance from the public standpoint of having assurance of ample railway transportation at all times, which can only be assured by keeping up the supply of equipment, expanding the systems as needed, improving roadway, terminals, shops and equipment as well as methods, in every way possible.

If persisted in, this tendency will do injury by limiting the expenditures of the railways for new work and ultimately will prevent the country from having as ample and as good transportation as can be provided. The public gain from the very best of railway transportation is many times more than the cost of giving such encouragement to railway management and railway investors as will insure such transportation.

It is only fair to say that in the Northwest due to the slower growth of traffic than in other parts of the country, and also to the large amount of traffic handled by the Panama Canal since the War, the railways are suffering from an insufficient volume of traffic as much as from anything else, and it therefore becomes a matter of paramount public importance to reduce the cost of operation in every way possible. The Northwest public has not in the past been fully alive to this phase of the public interest in its railways as evidenced by the full crew laws in two of our states which tend to increase unnecessarily the cost of handling freight.

Normal Expenditures of Capital Probable

By William Sproule

President, Southern Pacific Company

1. ANY forecast made far in advance of period of performance is necessarily subject to unforeseen developments that may seriously impair its value. The gross earnings of the Southern Pacific Company for 1927 approximate the largest on record and there is reason to expect a volume of traffic for 1928 fairly comparable with that of the current year, hence prospects for gross next year may be regarded as quite satisfactory. Unfortunately, inroads were made upon the revenues of 1927 by wage increases awarded after mediation and arbitration under established law, and there remains only a hope that we may be able to recoup some of these losses through increased efficiency during the coming year. The 1927 crops and business conditions were generally good throughout the territory served by Southern Pacific. There has been a recession in business in the last several months, particularly in building materials, automobiles and mineral products, and recovery in these respects may be expected. With favorable weather conditions during the winter, crops should be good and 1928 freight traffic generally ought to approximate that of the year just closing.

2. Annual capital expenditures of the railroads since federal control have averaged three-quarters of a billion of dollars. Improvement work is constantly going on with the object of handling the nation's growing traffic at the minimum cost and 1928 capital expenditures should be about what has become normal under modern railroad conditions.

Expenditures for equipment depend primarily upon traffic prospects, and as it is unlikely the traffic of 1928 will exceed that of 1927 these expenditures may be measured by the requirements for replacing obsolete equipment retired or to obtain increased efficiency in operation. With such purchases there should be no danger of equipment shortage.

The Southern Pacific Company is one of the systems that has consistently invested large sums in improving its equipment and facilities and has also just concluded a major construction program, involving new main line routes through Arizona and in Oregon, and recently made an extension into a highly productive section of Texas. These investments have yielded little as yet, but we naturally expect through development of traffic that we will realize on these projects as well as on our property in general the fair return prescribed in the Transportation Act of 1920. This largely lies with the Interstate Commerce Commission in its regulation of rates, and we are placing our confidence in the Commission carrying out the intent of that act. Failure in this respect would be very detrimental to future railway capital expenditures and consequent ability to perform adequate and satisfactory service.

Satisfactory Co-operation of Employees

By W. W. Atterbury

President, Pennsylvania Railroad

RAILROADS are operating today with greater confidence in the future than they have had in the last twenty years. This is due chiefly to two outstanding factors. First, railroad service itself is better than it ever was, and, second, the people of the United States know it and want it continued; and railroad investors are encouraged to furnish more capital for the expansion and improvement of that service.

It is generally recognized that the quality of railroad service consistently performed in recent years has contributed in no small degree to the continuance of the present prosperity of the American people. This realization is being translated into a willingness on the part of the public that railroads be allowed a fair share in the prosperity which they had helped to create.

One of the distinguished features of this prosperity is that profits have been made by turning over an enormous volume of goods at relatively small margins. Such an accomplishment would have been altogether impossible without quick, dependable and adequate transportation. Expedition of railroad service has reflected favorably upon the entire economic structure.

Of course the achievement of the last half dozen years would have been quite impossible without the co-operation of both employees and shippers. On the one hand this has enabled the railroads to get more intensive use out of existing facilities. On the other, it has enabled both railroads and industry to operate on a more scientific basis with respect to both the supply and demand for transportation service.

The most satisfactory feature of this existing situation is the spirit of co-operation on the part of the employee; and American employers reciprocate with a stronger desire than ever before to promote the welfare of the employee.

What has thus far been accomplished, however, represents only the beginning of the improvements that are possible in the railroad industry itself and in its relation to American industry and agriculture. Transportation needs of the future can be measured only in terms of the possibilities of the growth of the country itself. The ability of the railroad to promote this growth has by no

means been exhausted. Economic changes are occurring in our methods of production and distribution to which the railroad industry must continue to adapt itself.

More efficient operation has added great capacity to the existing railroad plant, but the need for actual physical expansion will always be present. Electrification, new and better ways of doing things, improvements in type of motor power and terminals, must be realized if the railroads are to perform their full measure of service.

All that will require continuous expenditures of new money, and the capital required must be obtained from investors in competition with other industries in which returns are in no wise limited as they are for railroads.

The outlook is bright. Railroad officers and owners feel the support of a constructive public opinion. Regulating authorities reflect that sentiment. The railroads and their owners are ready to go forward with the advancement of American business and welfare generally.

Railways in High State of Efficiency

By W. J. Harahan

President, Chesapeake & Ohio Railway

1. BUSINESS conditions generally were good in our territory during the past year. I believe moreover that improvement will be noted on a slowly advancing scale and that 1928 will on the whole be a period of substantial prosperity. Fundamentally our economic situation seems to be sound. Money is plentiful, labor available and there is little overproduction in basic industries, while the agricultural situation is steadily improving.

2. With capital expenditures this year of approximately $750,000,000, which brings the eight year total since the roads were turned back to the owners up to nearly six billions of dollars, the carriers find their plants in the highest state of efficiency in history. That the country has come to this time in such a comparatively comfortable condition is due, in no small part, in my opinion, to the highly satisfactory service which these expenditures have made possible.

The speed, dependability and promptness of rail transportation have resulted in a definitely established "hand-to-mouth" policy of buying, and the savings in manufacture and distribution, through quicker turnover and reduced inventories, have released many millions of heretofore tied-up capital for other purposes. This year we have made adequate expenditures in order to develop our facilities up to the highest point of efficient usefulness, and we shall go forward during the coming year on the same plan of adding to and strengthening our plant so as to be able to handle business in whatever volume it may be offered us.

3. In none of the seven years since the Interstate Commerce Commission fixed what it termed as a "fair return," have the railroads come within scores of millions of dollars of earning what was set as a maximum which they could earn. It is conservatively estimated that they have failed to earn this "fair return" by more than two and one-half billion dollars. In addition to this fact there are the other facts of decreased freight and passenger business and the rate readjustments, which have resulted in a reduction of average receipts secured from each ton of freight carried one mile of 16 per cent, compared with the rate received in 1921, and a reduction of 6 per cent for each passenger transported one mile.

I feel that the most constructive thing that could happen would be to have the public realize that it is of far more importance to them that carriers should have adequate revenues for consistent development and expansion than that the people should have whatever trifling savings come to them through these rate readjustments. The big advantage that an adequate and efficient transportation service gives to shippers far outweighs the comparatively negligible savings that result in individual cases that come from rate reduction. It seems to me that business men and the public as a whole are showing greater sympathy for the railroads and appreciation for their problems. As this feeling spreads more definitely to legislative halls, I apprehend that there will be less danger of binding, regulatory devices which might call a halt in the future development of the roads.

The Problem of Regulation

By L. A. Downs,

President, Illinois Central System

1. INSOFAR as they have a bearing upon future business activity, and thereby upon prospective railway traffic, present business conditions appear to be fairly encouraging. They are by no means uniform in all lines of business or in all parts of the country, but on the whole there seems to be a clear predominance of favorable over unfavorable elements.

High among the favorable elements in the present situation I would place the prospective demand for goods and services, which is assured by the virtual abandonment of forward buying for speculative or other reasons. I am aware of the merits of the criticism directed at the prevailing practice of so-called hand-to-mouth buying, but it has the important virtue that by keeping down inventories it insures the presence of an unfailing demand for the products of business activity. When business follows the day-to-day needs of the country, as it has so closely in the last three or four years, it may and will vary, but it cannot fall below the level of those ever-present needs. We are therefore assured of having business sufficient to sustain the economic life of our population—there is that much to start with.

The favorable elements in the present situation, however, do not end here. Agriculture has continued to improve. The increased buying power of the farm population, as a result of higher prices for the things it sells and lower prices for the things it buys, is certain to have widespread beneficial results.

The economic importance of the south is increasing, and the present outlook for the south is especially favorable. Along with an increase in the aggregate value of the 1927 over the much larger 1926 cotton crop, there has been further material progress in diversification, not only of agricultural production but of industrial enterprise.

(Continued on page 22)

Railway Situation from Supply Manufacturers' Standpoint

"Substantial reasons for encouragement" — Freight car situation—Capital investment needed for "modernization" that will effect operating economies

By Alba B. Johnson
President, Railway Business Association

MANUFACTURERS of railway equipment, materials and supplies enter upon the new year with substantial reasons for encouragement. Since the recession in 1924 the part traditionally played by railway purchases in sustaining general prosperity, suspended in considerable degree while the roads were living on the slack due to increased efficiency, was taken up by activity arising from the motor car industry. After a slight hesitation in January railway gross and net earnings increased through April. In May came the shutdown of the Ford plants and curtailment in the whole motor car industry. A decline in railway traffic and earnings promptly followed, sharply accentuated in June and continuing downward as the recession broadened. It has been widely predicted that once the new Ford model in considerable road use shall have been appraised by the public the resultant orders for Fords and for other cars of various grades will restore the expanding trend of industrial activity which was interrupted in May.

Resumption of general business expansion rising to substantial proportions in 1928 has been predicted by many prominent observers. Current railway operating income, on the other hand, having tended downward since April almost to the date on which I write (Dec. 22), so far as I have had communications from them railway officials express an inclination to look at the boom prophecies through the blue glasses of anxiety. Later than these communications are news reports indicating that in recent weeks orders and inquiries have been broadening over a considerable range of railway purchases.

No more than in earlier eras will incredulity prevent sudden and great expansion or the railroad buying necessitated thereby. Daily production of automobiles is understood to be rapidly mounting. Prophets of a continuing upward swing are also backed by favorable estimates of farmers' prospective buying power, by signs of a rising price movement in trade and industry and by other significant indicators. Issues and candidates for the Presidential canvass thus far discussed do not foreshadow anxiety concerning governmental policies affecting business. We are advised to look for a prosperity taking in a wider range of manufacture and business than have shared such activity as has been seen since 1923. The recent purchasing attitude of the roads appears to have been based on doubt that traffic will enlarge very much faster than in recent years, and the surplus of equipment is largely due to new efficiencies postponing but not obviating the exhaustion of slack. This is in a period when, as Virgil Jordan, chief economist of the National Industrial Conference Board, told the Railway Business Association November 16, "prosperity" has embraced "turnover of shares in the stock markets, stock prices, automobile production, gasoline and silk consumption, cigarette consumption, the amount of insurance written, diamond sales, real estate transfers," whereas in a "real" expansion such as he foresees "prosperity" will include "boots and shoes and textiles and coal and iron and steel and the little business man and the small manufacturer."

Railway Purchases and Earnings

In past periods, with the exception of such notable bargain-hunters as Mr. Harriman, Mr. Cassatt and a few others, railway managers and boards have waited for the actual up-turn in gross and net earnings before manifesting the revival of hope by a vigorous enlargement of facilities. Observers and participants hold views to extremes. With the shipper who remembers past shortages the dominant thought may be a reluctance to have the roads run the risk of not having enough facilities. With the ultra-conservative railway official a ruling instinct may be to shrink from the risk of providing more facilities than prove to be required. Railways themselves range widely in this respect. Purchasing begins with the strongest and boldest roads, a large part of the rest trailing along with their programs in a cumulative climax of competition for deliveries.

In the present instance the unfavorable financial exhibit seems to have been due not alone to falling volume of traffic, nor exclusively to this plus increased operating expenses—though the cycle of wage advances now beginning to take substantial effect overhangs the situation; but to a steady and, by the public, little realized, downward trend in revenue per unit of transportation service rendered. If the average ton-mile receipts in 1923, when the horizontal reductions of 1922 were effective, had been applied to the ton-miles of June, July and August in 1927, the total gross earnings of the roads would have been $30,100,000 more than they were. In the last five years, 1922-26 inc., June, July and August freight earnings averaged 24.76 per cent of freight earnings for the year. If this ratio prevails now, the additional freight receipts per annum which the roads would have earned had 1923 rates applied to 1927 traffic is $121,568,000. Nor do these figures fully reflect the rate situation. They are in the face of a decentralization of production in the heaviest commodities, which on the average are being hauled shorter distances. Other classes of freight must have averaged a still greater decline in rates. This is at a time when passenger traffic and earnings have appreciably fallen off—the

grand result of receipts and expenses being that net railway operating income has never equalled the amount contemplated by Congress.

The rate situation has a distinct connection with the facility surplus. As I remarked to members of the Railway Business Association transmitting the letter by Chairman Esch of the Interstate Commerce Commission, "Rate Regulation as the Commission Sees It":

"Rate changes are made in conference between shippers and railway officers or in classification committees under supervision of the Commission, or in proceedings on proposals for increases or reductions or for adjustments involving both advances and reductions."

The railways since 1923 have been in something of a dilemma. When the properties were returned to their owners the country expected such a demonstration of operating capacity as would put out of discussion any proposal for another experiment in federal control. Vigorous additions and betterments as well as progressive steps in management and in winning the co-operation of shippers followed. The country was served. To complete the demonstration it was necessary that the country be told that it had been served. It proved possible by comparisons to report advances in efficiency which have drawn expressions of amazement and admiration from everyone competent to judge. The slack of existing facilities thus created was statistically described and the series of announcements may be said to have culminated in a report of the Car Service Division, American Railway Association, in May, 1927, containing the remark that with 100,000 fewer freight cars than were then owned, the roads for some time to come could handle the traffic provided various measures were continued and others pursued. An aspect of these announcements through the years 1923 to date was the in-put of new capital.

Whatever the rate level and whatever the drift of railway income, here were the indisputable facts that service had been on a new high plane of excellence and that capital in huge amounts had been invested. In any kind of rate adjustment—informal, semi-formal or in issue joined before the Commission—the railway traffic official entered the discussion surrounded by the atmosphere which such service and such investment had created—namely, little manifestation of anxiety, if any, on the part of those concerned as to the effect which rate reductions or obstruction to rate advances might have upon net income.

The Freight Car Situation

That was the situation when the October statement on equipment revealed that a rather startling part of the slack had been taken up by increasing traffic combined with a retardation in replacements and additions. Responses to my analysis of that situation contain good news to the railway supply guild; for it is obvious that some responsible minds in the railway, shipping and government fields have gone resolutely to work upon the essential but hitherto almost untouched problem of formulating and applying a yardstick to current preparedness, facility estimates, investment inflow and rate regulation as related to all these. Generalizing from some striking instances in my correspondence, our reference to voluntary and unresisted rate reductions, followed by references to this in Chairman Esch's letter on the subject, has met with sympathetic response in the field of railway ownership, direction and management.

On the more distinctively industrial and commercial side of the outlook two developments deserve attention.

The first is especially interesting to car builders and those who furnish material and parts for cars. In the years since 1923 there has been a progressive increase in the size of new freight cars. All along it has been foreseen by most people that a limit would come in this direction. The reasons are too familiar to require enumeration here. But there is another phase as to car size. In our recent computations of car supply the measure employed has been the total number of capacity tons of all cars. This has been criticized, we now think soundly. I believe we must come to see that in a fuller sense than has been appreciated "a car is a car." Certainly large cars will do no more work than smaller cars if they carry loads averaging no larger per car. As was set forth in the May report of the Car Service Division, average loading per car has been disappointing. High point was reached in 1920—29.3 tons. In 1921 the figure dropped to 27.6, in 1922 to 26.9, and while it rose again in 1923 to 27.9 it has never again reached 28 and for the first nine months of 1927 was 27.3. Doubtless in time of extreme congestion many of the roads, perhaps all of them, which in ordinary times maintain less-than-car-load merchandise service, would transfer this scantily filled quota of their rolling stock to business in which cars could be more fully loaded. Aside from this resource the trend of average loading per car has not been such as to indicate that the addition of cars of the larger sizes will actually haul freight in quantities proportionate to the added total capacity tons.

Modernization of Equipment

If predictions of business expansion should be fulfilled and the railways should presently resume car orders, nobody need be surprised to find that the number of cars will receive relatively more attention than their size and that insofar as the prosperity of car assemblers and purveyors of materials and parts is promoted by an increase in the number ordered as contrasted with the total tonnage capacity built, they may count in due course upon some degree of return to former volume of production.

The other point which I have in mind is betterments, or what has come to be termed modernization. The Car Service Division report already cited contemplates "that there be a continuation of the replacement of the smaller and less efficient cars with cars of modern type." What is said of efficient units must apply, of course, in any comprehensive view, to every facility which the roads use; not only to specification of design, material and parts in new installations, but to modernization of whatever is rebuilt. As its second condition the Car Service Division mentions "that there be a continuation of the present plan of maintaining equipment at the highest practicable point." For "equipment" read "facilities."

A useful catalogue of possibilities for progress was made by Roy V. Wright in a paper read before the Railway Business Association in 1926 on "The Future of the Railway Supply Business." He mentioned the superheater as "typical of what has happened in the development and introduction of many of the special devices used on cars and locomotives which have added to the effectiveness of equipment, as well as to the ability to handle increased traffic volume at lower and lower unit costs. In general," said Mr. Wright, "the same thing may be said of a great variety of special devices and facilities used in the maintenance of equipment and maintenance of way as well as in the operating, engineering, signalling, telegraph, electrical, accounting and other departments. It will suffice here to mention at random a few of these, such as rail anchors, ballast cars, power tie tampers, ballast cleaners, locomotive cranes, ditchers, section motor cars, autogenous welding, water treatment, signalling apparatus, auto-

matic train control, telegraph and telephone apparatus, master car builders' billing machines, etc. Nor should be overlooked such contributions as electrification, or the possibilities involved in the internal combustion engine." It has been quite clear since the first large-scale rate cases decided in 1911 that carriers will be expected at all times to meet any need of larger income in substantial part through economies. Shippers and regulators will insist that economies shall embrace not merely efficiency in handling facilities but progress in developing these. The shipper is asked to pay freight rates which will make railway securities attractive to the public. He inclines to insist upon the application of capital so obtained in reasonable measure to mechanical progress for reduction in operating expenses. A thorough-going response to this opportunity, while permanently benefiting the public, will do something toward solving the problem of depression and discouragement in our industry.

I have before me an analysis which brings out vividly the tremendous task remaining to be done merely in bringing all the roads up to the standard of the most progressive as things now stand. Comparison of achievement in economy is beset with complications. One system operates over mountains, another over plains. Economy may be shown where several factors are present, not all mechanical and no one of them capable of isolation. Increase, for example, in average train load might be due to other factors than size of cars and power of locomotives; such as double-heading of locomotives, use of high power air brakes, heavier weight of rail and strengthening of bridges. Forgetting certain items, we may arrive at apparent economy which will not bear analysis. For example, it is beginning to be seen that average train loading is not so certain a measure of economy as has usually been thought; since under some conditions there is a limit to the size of train which can be expeditiously and hence economically moved.

Railways' Progress in Efficiency Varies

I have selected two items—one in which the mechanical element is very little complicated with the other factors, and one which is believed to comprehend the whole picture of progressiveness. The single item is the number of pounds of coal per 1,000 gross ton-miles hauled. The comprehensive item is gross ton-miles per train hour. By tons is meant burden plus weight of train. To be significant, mechanical and methodical improvements must be somewhere standard; a number of railroads must be successfully using them. Comparison therefore is between systems. Thus can we discern what economies might be attained if by larger and wider applications of capital all the roads could be brought nearer the standard of those which have been able to show the greatest progress. Conditions so differ among systems that it may cost Railway A as much for mechanical improvement as road B, yet A will use 140 pounds of coal per 1,000 gross ton-miles and B only 80; and so also with gross ton-miles per train hour. Seeking indications of capital investment in improvements for economy our contrast therefore is in bettered score percent as between roads which at the beginning of the period stood about the same. Statistics go back to 1920 only. In fuel consumption progress is indicated by reduction in the number of pounds per 1,000 gross ton miles; in train performance, progress is indicated by the increase in gross ton-miles per train hour.

In 1926 there were 51 roads earning gross revenue of $25,000,000. For the two items, fuel and train hours, tables may be constructed each ranking the systems in order of merit in 1920, with the score in 1926 and the improvement percent 1926 over 1920.

First consider fuel. At the beginning of the period six systems had gotten down to 160 or better. Their improvement in the six years spread from 27.1 per cent to 11.2 per cent. Between 160 and 180, eight roads ranged from 22.9 per cent to 2.4 per cent. Between 180 and 200, 13 roads' reductions ran from 38.8 per cent to 16.1 per cent; between 200 and 225, 11 roads, 36.3 per cent to 16 per cent; between 225 and 250, 10 roads, 45.2 per cent to 16 per cent.

Now glance at ton-miles per train hour. Three roads started in the 19,000's. Their improvement percent ranged from 44.7 per cent to 25.4 per cent; three in the 18,000's showed gain percent as low as 26 and as high as 40.2; seven in the 17,000's spread from 45.8 per cent to 19.3 per cent; three in the 16,000's, 53.5 per cent to 33.6 per cent; four in the 15,000's, from 77.3 per cent to 33.1 per cent; seven in the 14,000's from 45.4 per cent to 3.3 per cent; seven in the 13,000's from 81 per cent to 16.3 per cent; four in the 11,000's from 52.3 per cent to 24.8 per cent; seven in the 10,000's from 98.2 per cent to 26.7 per cent.

From the width of these spreads the conclusion is irresistible that nothing approaching the possibilities has been done in the application of capital to physical modernization.

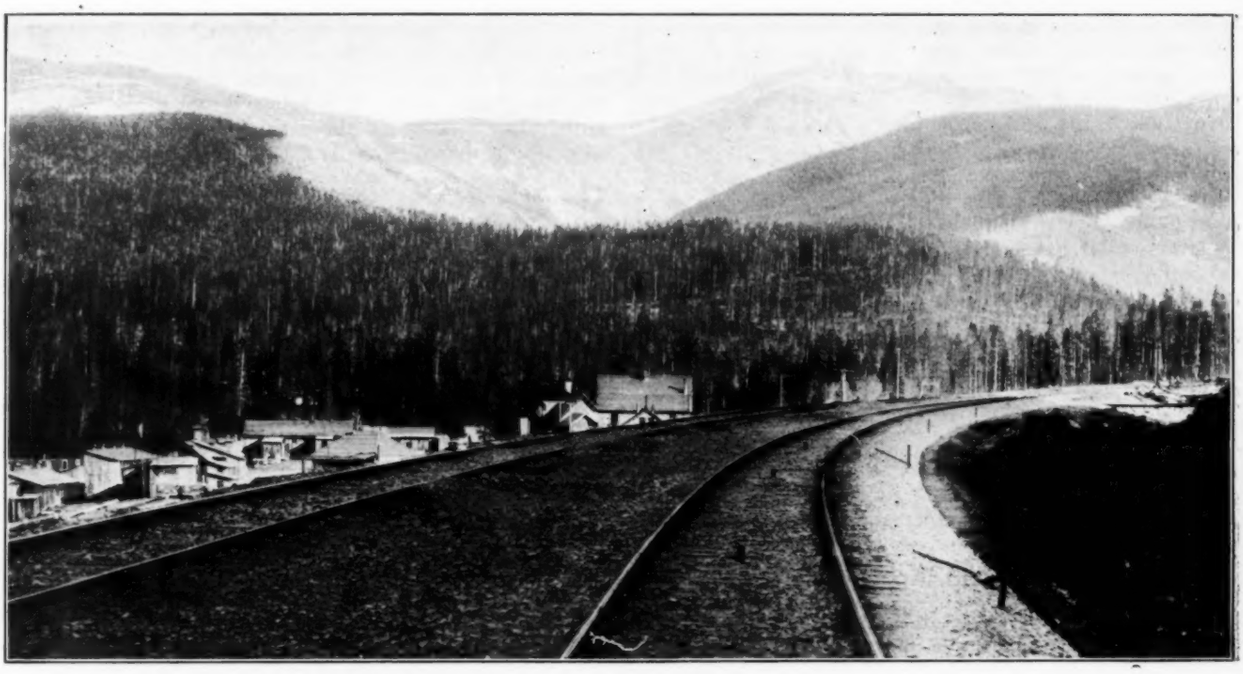
"Progress Rather Than Cheese-Paring"

Congress is being pressed for legislation to foster railway unifications. The Railway Business Association restricts its plank on that subject to opposing compulsion. We neither urge nor resist the tendency. Practically everyone, however, who discusses the general aspects seeks to forestall subsequent disappointment by a warning against the hope for much from economies the result of cutting down the number of systems. I go much further. To me it seems plain that only the liveliest and most constant vigilance on the part of all concerned will protect the limited number of systems, when we get them, against frozen standards, starvation of inventors and of developers of devices for economy and the cessation of that progress which alone fights for the public against higher rates as cost rises. But what have the promoters of unifications defined as the public necessity which in their judgment makes concentration indispensable? This—the diffusion of the strong roads' credit over the weak lines, thus tending to keep down rates and so to reconcile the public to whatever rate level under those circumstances may be required to attract sufficient capital for meeting the transportation needs of the country through adequate additions and progressive betterments.

Shall the whole project fall to the ground through our failure to agitate incessantly for progress rather than for cheese-paring as the policy aimed at? Evidently unification is coming. Decentralization of purchases, of tests and of mechanical development within each system is essential if unification is not to spell stagnation equal to that with which government ownership usually blights any business that it clutches.

Essential also is close scrutiny of tendencies toward manufacturing in railway shops. Unifications may aggravate the temptation. Mr. Wright, commenting on his list of progressive improvements already cited, remarked: "Without the services of highly specialized technical, industrial and commercial talent of the organizations now selling these things to the railroads, many of them would never have been developed, others would remain crude and inefficient and the cost of many

(*Continued on page* 88)



The Approach to the West Portal of the Moffat Tunnel

Continuation of Liberal Improvement Program Forecast for 1928

A study of budgets for 27 roads indicates capital expenditures aggregating $750,000,000

By Elmer T. Howson,
Western Editor, *Railway Age.*

THE railways of the United States and Canada will spend approximately $750,000,000 of new capital for equipment and for new extensions and other additions to their roadway facilities during 1928. This forecast is based on information received direct from the railways regarding their plans, supplemented by statements from railway and industrial executives and by a study of the present and prospective traffic and of the relation of this traffic to earnings and expenditures. It has been checked by comparisons with similar information furnished us for the same periods during each of the last five years and with the amounts actually spent for these purposes in these years.

The figures are exclusive of still larger amounts which will be spent for current repairs and maintenance of the railway properties, chargeable to operating expenses. They compare with a forecast of $750,000,000 to $900,000,000 made in these columns a year ago and with actual expenditures by the Class I roads of the United States alone for 1927 (with the last three months estimated by the Bureau of Railway Economics) of $750,000,000, bringing the total capital expenditures for *all* roads in the United States and Canada to somewhat more than $800,000,000.

A comparison of the budgets received from the roads this year with those of the same roads last year indicates a slight decrease in activities in 1928. All figures of this character, must, however, be interpreted in the light of related trends which affect the earnings of the roads. The year 1927 opened with traffic and earnings at record high levels. The demand for facilities was likewise at the maximum. As the year advanced, however, business receded slightly and during the last six months ran below that of the corresponding period of the previous year. This had an effect on improvement programs. While the decline was not sufficiently pronounced to lead to the suspension of work already authorized, it did remove the necessity for immediate relief at congested points and reduced the amount of work undertaken during the latter part of the year.

The same conditions must be considered in arriving at an estimate of the expenditures that will be made during 1928. The year opens with traffic about 10 per cent below the record of a year ago. The consensus of the railway executives who are quoted on the pages immediately preceding, however, is that the traffic in 1928 will be as heavy or heavier than in 1927 and there are many who believe that it will again be at a high level by mid-summer. Numerous conditions give support to this belief. Particularly in the Northwest, the excellent crops, with their resulting increase in purchasing power in that area, give support to the prospect that traffic will increase. Therefore, while the traffic outlook caused us to reduce our forecast slightly last year from the total indicated by the budget figures we then had, the same reasoning causes us to give a more liberal interpretation

to this year's figures and to predict that the year 1928 will witness the continuation of the program for the improvement of railway facilities on approximately the same scale as in 1927.

In Canada the outlook is for considerably more liberal expenditures than in 1927. While the plans of the two major systems have not progressed to the point where definite information regarding this year's projects is available, these roads have already undertaken the construction of nearly 400 miles of new lines, work on most of which was started so late last fall that relatively little progress has yet been made. In addition, work has recently been resumed on the extension of the Hudson Bay railway, involving 239 miles of new lines. In all, more than 640 miles of extensions alone are now under construction in Canada as compared with 309.6 miles completed during 1927.

The Limitations of the Budgets

In the consideration of the figures which are included in this study of the improvement programs of the roads, it should be borne in mind that this article purports only to present as accurate an *estimate* as can be made at this time of the work that the roads will do during the year. This forecast is, of necessity, based on the budgets of a limited number of roads. This is due to the fact that many roads, including some of the largest, such as the New York Central and the Louisville & Nashville, do not prepare budgets, but authorize expenditures individually as the necessity for them arises at any time during the year. Other roads, including such large systems as the Pennsylvania, the Chicago, Burlington & Quincy, the Chicago & North Western and the Illinois Central, which follow the plan of preparing budgets, have been delayed in the completion of their plans this year with the result that their information was not available in time for inclusion in these statistics. Furthermore, with respect particularly to equipment, not a few roads hesitate to make public their plans relative to prospective purchases or to indicate that they contemplate buying any locomotives or cars until they are ready to enter the market.

In the preparation of this information it is also recognized that the approved budgets given us include only those projects that have materialized in sufficiently definite form to warrant the managements in taking favorable action. Even on those roads which follow the budget system closely projects arise throughout the year which demand favorable consideration and the approval of these swells the expenditures beyond the budget details.

In spite of these limitations, however, past experience has shown that the budgets that are available are sufficiently representative of the roads as a whole to provide a basis for a fairly accurate forecast of the year's activity. Thus, in the *Railway Age* of January 2, 1926, it was estimated that the expenditures for improvements in that year by all of the railways of the United States and Canada would approximate $750,000,000 to $900,000,000, whereas the actual expenditures for the Class I roads of the United States alone aggregated $885,086,000 and the total for all of the roads in the United States and Canada exceeded $925,000,000. Likewise, in the issue of January 1, 1927, it was again estimated that the roads of the United States and Canada would spend $750,000,000 to $900,000,000 for capital improvements and, as stated above, the capital expenditures of the Class I roads of the United States (with the last three months estimated by the Bureau of Railway Economics) aggregated $750,000,000, bringing the total expenditures for all roads, including Canadian, to more than $800,000,000.

Because of this record it is believed that the forecast presented herewith offers as accurate an estimate of the magnitude of the railway expenditures as it is possible to make at this date. It is believed that it also indicates with relative accuracy the attitude of railway managements as a group towards the business outlook.

The Budgets On Which Our Estimates Are Based

In arriving at our estimate of the amount of new capital that will be added to the investment of railway properties during the year, we were aided materially by data furnished us by 27 representative roads with a total mileage of 80,241, including the following:

Atchison, Topeka & Santa Fe
Central of Georgia
Central Railroad of New Jersey
Chicago & Eastern Illinois
Chicago Great Western
Chicago, Indianapolis & St. Louis
Chicago, Rock Island & Pacific
Denver & Rio Grande Western
Delaware, Lackawana & Western
Duluth & Iron Range
Duluth, Missabe & Northern
Elgin, Joliet & Eastern
Great Northern
Gulf, Mobile & Northern
Lehigh Valley
Long Island
Louisville & Nashville
Minneapolis, St. Paul & Sault Ste. Marie
Missouri-Kansas-Texas
New York, New Haven & Hartford
Norfolk & Western
Northern Pacific
Pere Marquette
Reading
Union Pacific

An analysis of these budgets shows that these 27 roads plan to spend $219,224,421 for capital improvements in 1928. If other roads in the United States and Canada should spend at the same rate the total sum will approximate $825,000,000. A part of this total mileage is, however, made up of short lines and those in sparsely developed areas which spend relatively less than the average. Recognizing this, we reduce our estimate to $750,000,000. This compares with total capital expenditures for the years immediately preceding as follows:

1920	$653,260,000
1921	557,035,000
1922	429,273,000
1923	1,059,149,000
1924	874,743,000
1925	748,191,000
1926	885,086,000
1927 (last 3 months estimated)	750,000,000

Such a program is noteworthy because of the fact that it follows several years of equally active improvement. During the eight years from 1920 to 1927 inclusive, marking the period since the termination of federal control, it will be noted that the railways of the United States alone spent $5,956,744,000 for the improvement of their properties. In other words, they have increased their investment about 25 per cent in this period. Even more outstanding is their work during the last five years, during which time they have expended $4,317,169,000 of new money or an average of more than $850,000,000 annually.

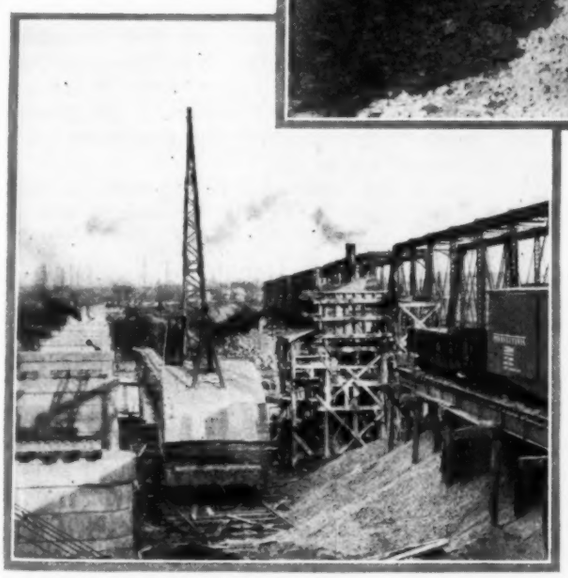
The continuation of this program on such a liberal scale is also unusual because of the fact that by reason of the large expenditures already made, the roads were able to handle the heaviest traffic in their history during the latter part of 1926 and the early months of the year just closed without any evidence of congestion or delay and with an actual surplus of facilities. The fact that in the face of such a record they proceed to add still further to their facilities affords evidence that they in-

St. Louis-San Francisco Builds Gulf Coast Extension

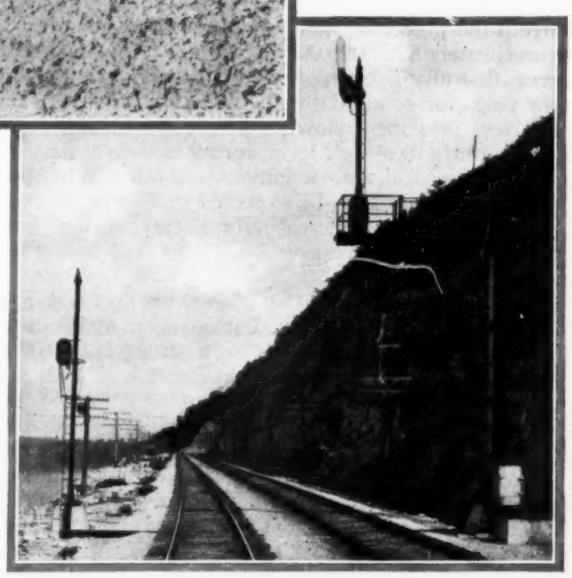
In the Quitaque Canyon on the Ft. Worth & Denver South Plains

Rock Island Builds New Line North from Amarillo, Texas.

One of the Shovels Employed on the Chesapeake & Hocking.



Pennsylvania Builds New Bridge over Wabash River for Second Track on St. Louis Division.



Missouri Pacific Completes Second Track Along Missouri River.

Center, New Tunnels for Second Track on Kentucky Division of the L. & N.

New Lines and Second Track Construction in 1927

tend to keep their facilities ahead of the demands that may be made upon them in periods of sudden increases in traffic. It also indicates optimism regarding the conditions immediately ahead.

The magnitude of the expenditures included in the budget also indicates a realization on the part of many railway executives that there is a wide gap between the point when the volume of traffic makes added facilities necessary and the point when these facilities are justified on the basis of the economies they will effect. More and more the improvements being made are of the latter class, prompted by the return they will earn in the form of operating economies. It is significant that, in general, those roads which have been prosecuting such programs actively of late are continuing them this year, indicating the vast opportunities that still await other roads which have been more backward in this respect.

Large Appropriations Carried Over

In addition to the appropriations included in the budgets for new projects these 27 roads carried over into the new year $49,000,000 in unexpected appropriations for work not yet completed. On this basis the total amount carried over for completion in 1928 by all of the roads exceeded $200,000,000 exclusive of equipment ordered in the closing weeks of the year, payment for which will not be due until delivery. While large, this sum is considerably smaller than in recent years. Thus, the amount carried over from 1925 into 1926 approximated $475,000,000, a figure made unduly large by numerous orders for equipment placed late in the year. A year ago more than $350,000,000 was carried over into 1927 and to this was added the liberal appropriations for additions and improvements made during the year and particularly during the early months. Following the decline in traffic during the latter part of the year, however, less new work was authorized in the closing months of 1927, which fact explains the smaller amount carried over into this year. This is illustrated by the experience of one large western road which carried over into 1928 unexpended authorizations aggregating only $110,000 of a total budget of $27,000,000.

The total sum available for expenditures during 1928, including both new appropriations and those carried over from the preceding year, may, therefore, be placed at approximately $950,000,000. It is not to be expected, however, that all of this money will be spent during the current year, for some of this work will of necessity be carried over into the following year. Furthermore, if business returns to a high level during the early part of the year, as many railway executives and other industrial leaders anticipate, it is to be expected that improvement authorizations will be increasingly liberal as the year progresses and the carry-over into 1929 will be correspondingly greater.

Among the roads with the larger unexpended appropriations are the Delaware, Lackawanna & Western with $3,000,000; the Great Northern with $12,000,000, more than $9,000,000 of which is in connection with the tunnel through the Cascade mountains and the change of line on the east approach; the Louisville & Nashville with $18,000,000, including $5,000,000 for equipment and $5,200,000 for a 13-mile line through the Cumberland mountains of eastern Kentucky, and the Reading and the Union Pacific with $4,977,000 and $6,000,000 respectively for a variety of projects.

Individual projects of large magnitude which have been carried over include the Chesapeake & Ohio bridge across the Ohio river and other improvements at Covington, Ky., with $10,000,000 unexpended; grade separation in Milwaukee, Wis., on the Chicago, Milwaukee & St. Paul, with $3,000,000 unexpended; terminal improvements on the Cleveland, Cincinnati, Chicago & St. Louis with $6,000,000 unexpended at Cleveland, Ohio, and $1,241,000 at Sharonville,; electrification of the Pennsylvania's line between Philadelphia, Pa., and Wilmington, Del., with $5,500,000 carried over and $3,500,000 for the renewal of a bridge over Newark bay, jointly with the Lehigh Valley; the elimination of grade crossings by the Reading at Manayunk, Pa., with $4,000,000 carried over and the revision of station facilities at Huntington street, Philadelphia, by the same road, $1,700,000.

The New Budgets

Among the roads which have indicated that they are contemplating large capital expenditures during 1928 are the following:

Atchison, Topeka & Santa Fe	**$42,800,000**
Great Northern	**24,000,000**
Union Pacific System	**19,982,000**
Delaware, Lackawanna & Western	**17,140,000**
Norfolk & Western	**12,000,000**
Northern Pacific	**11,407,051**
Lehigh Valley	**11,000,000**
New York, New Haven & Hartford	**9,800,000**

These appropriations will go for a vast variety of facilities which make up a railway. They are divided into two major groups: (1) equipment, consisting primarily of cars and locomotives, and (2) roadway and structures facilities.

In the budgets sent us approximately $58,000,000 is allocated definitely for equipment as compared with $123,000,000 for roadway improvements. In other words, of those budgets for which we have received this division approximately 32 per cent of the total funds are allotted for equipment and 68 per cent for roadway improvements. This compares with 30 per cent for equipment and 70 per cent for roadway in the budgets received last year. This general division indicates a continuation of the tendency in recent years of devoting a larger percentage of the total expenditures to those facilities which promote the more intensive use of equipment and a smaller proportion to equipment itself, although the figures this year also confirm the impression that prevails in many quarters that the tendency for the equipment proportion to decline has been arrested and that 1928 will see relatively larger expenditures for equipment than in the recent past, which belief is supported by the slightly greater increase in the percentage of this year's budgets allotted for equipment as compared to those of a year ago.

The trend of this division of the expenditures between equipment and roadway in recent years is shown in the following tabulation:

Year	Total capital expenditures	Expenditures for equipment	Per cent of total	Expenditures for roadway	Per cent of total
1923	$1,059,149,426	$681,723,991	64	$377,425,435	36
1924	874,743,228	493,608,460	56	381,134,768	44
1925	784,191,000	338,114,000	45	410,077,000	55
1926	875,000,000	380,000,000	43	495,000,000	57
1927 (first 9 months)	570,215,000	204,992,000	36	365,223,000	64

This trend from the proportions prevailing in 1923 is a natural one, for it indicates a return to the more nearly normal pre-war ratio when approximately one-third of the capital expenditures went for equipment and two-thirds for fixed properties. The slightly higher percentage of the appropriations scheduled for equipment this year indicates a belief on the part of the railway managements that their rolling stock has declined to the minimum consistent with efficient transportation service. For the comfort of the equipment builders, it should also be borne in mind that the greatest swell in

appropriations during the year is commonly found in equipment, which is ordered without advance notice as the need arises and which many roads refrain from including in the budgets which they make public. Thus, while the information sent us a year ago indicated that only about 30 per cent of the appropriations would go for equipment, the actual expenditures for the first nine months of this year showed that this proportion actually increased to 36 per cent. For this reason it may be expected that at least 40 per cent of the expenditures this year or approximately $300,000,000, will go for cars and locomotives and their accessories.

Less New Lines Will Be Built

In analyzing the budgets that we have received, one of the outstanding characteristics is a marked curtailment in the mileage of new lines contemplated. This is in contrast with the conditions that have prevailed during the last two years. In 1926, 1,005 miles of new lines were built, a mileage greater than in any year since 1916. While the mileage completed in the year that has just closed fell back to 772, this was still a larger mileage than had been placed in operation in any year since 1917, with the single exception of 1926. Furthermore, 900 miles of new lines are now under construction, most of which will be completed during the early months of this year. The carrying over of this large mileage of extensions is due in a large measure to the adverse weather last spring which retarded construction operations sufficiently to prevent the completion of the lines before winter. This was true of the Illinois Central's new line through southern Illinois and of the St. Louis-San Francisco's connection with its recently-acquired Pensacola line, which two projects alone include more than 300 miles of lines.

In contrast, no extensions approaching this magnitude appear in the budgets furnished us, and the indications are that the mileage of new lines authorized during this year will not exceed more than half of that now under construction, although it is probable that, because of the large mileage of lines already under construction, the total mileage completed during the current year will exceed that of any year since the war. The mileage of lines in prospect consists primarily of relatively short extensions to open up new areas for settlement in the west and to provide connections between existing lines. Typical of the latter is a 13-mile extension which the Louisville & Nashville will construct through the mountains of eastern Kentucky at a cost of more than $5,000,000. Among the longer extensions planned is one of 53 miles by the Union Pacific.

A similar, although less pronounced tendency is shown in the amount of second, third and fourth track construction projected. A total of 710 miles was completed in 1925 and 522 miles in 1926; in 1927 this fell to 473 miles. From the information contained in the budgets it appears that less than 400 miles of multiple main tracks will be undertaken next year. While only 20 miles in length, one of the most expensive sections shown on the budgets is on the Lackawanna, where 20 miles of third and fourth tracks is estimated to cost $2,700,000.

Terminal Facilities Will Receive Attention

The roads are recognizing the continued necessity for the consideration of their needs for freight classification facilities, for a number of the budgets contain relatively large appropriations for new facilities and more frequently for the revision and enlargement of existing facilities. While the budgets do not indicate as extensive programs of terminal reconstruction as prevailed on the Southern two or three years ago or on the Norfolk & Western last year, they indicate that the work this year will include the revision of the layouts at a larger number of points than in the past.

The passenger terminal construction this year will be characterized by the prosecution of work on a number of outstanding projects of magnitude, including the continuation of work on the Cleveland Union Station and the inauguration of work at Cincinnati. The budgets indicate also that the roads as a whole are giving increasing attention to the improvement of their facilities at the less important points to bring them into harmony with the facilities elsewhere on their lines. In like manner, a number of roads are planning the improvement of their local freight handling facilities. Among the more important authorizations of this character, the Norfolk & Western has appropriated $1,000,000 for facilities at one point, the New Haven $800,000 and the Elgin, Joliet & Eastern $500,000.

As in past years, only a limited number of roads are contemplating the extensive revision of their car and locomotive shop facilities, but these revisions, when made run into large sums of money. From the budgets furnished us it would appear that the roads will spend more than $15,000,000 for major improvements of this character next year. Among these, the New York, New Haven & Hartford has set aside $850,000 and the Northern Pacific $1,175,000, while another western road plans to spend $800,000. Budgets for shop tools, however, are more common. Sixteen of the 27 roads reporting indicate their intention to spend more than $2,400,000 for this purpose, at which rate the capital expenditures for the year for shop tools will approximate $10,000,000, this amount representing added investment above the cost of the tools replaced.

That the roads still value highly the possibilities of automatic signals as a means of facilitating the movement of traffic is indicated by the fact that eight of the roads whose budgets we have, indicate that they will spend approximately $1,800,000 for facilities of this character. The outstanding appropriation of which we have been advised is that of the Denver & Rio Grande which has set aside $590,000 for 204 miles of signals, while the Union Pacific, long a pioneer in the use of signals, will extend this form of protection over 58 miles of lines this year.

Large Appropriations for Grade Separation

A significant reflection of the times is the large and rapidly increasing proportion of the available funds that are being spent for the separation of grades with streets and highways. Practically every road whose detailed budget we have is making provision for the elimination of one or more important crossings. The aggregate sum set aside for this purpose by the roads whose figures we have exceeds $17,000,000, or approximately eight per cent of their total budgets. On this basis the amount that will be spent in 1928 for the elimination of grade crossings will exceed $65,000,000. Among the larger programs of which we have been advised, are those of the Central Railroad of New Jersey, $2,500,000; the Delaware & Hudson, $1,650,000; the Delaware, Lackawanna & Western, $2,000,000; the Pere Marquette, $1,000,000; the New York, New Haven & Hartford, $1,200,000; the Norfolk & Western, $4,500,000; the Northern Pacific, $950,000; and the Minneapolis, St. Paul & Sault Ste. Marie and the Great Northern, $600,000 each.

Although commonly considered maintenance expenditures, the renewal of rails and the reballasting of lines make serious inroads on the capital as well as on the

operating funds of the roads. The rail and ballast programs have been particularly liberal during the last two or three years with the result that the tracks are now in better condition than ever before in their history. At the same time, it is evident that the managements of the railways are still of the opinion that much further improvement in this direction is warranted, for the programs for both rail and ballast for the roads whose budgets we have indicate that they contemplate about 20 per cent larger programs this year than in 1927. This is borne out in part by a comparison of the orders which the roads have already placed for rails for next year's requirements. A comparison of these orders for the same roads, involving approximately half of the country's annual production, indicates a tonnage slightly in excess of that of last year which in itself approached, if it did not equal, the high record in recent years.

In addition to the expenditures that are more readily classified, the roads are called upon to make a large variety of other expenditures, including those for the strengthening of bridges, for new or improved water stations, for water treating plants, etc. More than $75,000,000 will go for miscellaneous expenditures of this character this year. Among these improvements the Chicago Great Western will spend $100,000 chargeable to capital account for the strengthening of bridges; the Chicago, Indianapolis & St. Louis a similar amount; another western road, $1,500,000; the Denver & Rio Grande Western, $910,000; the Union Pacific, $800,000; the Northern Pacific, $650,000; the Pere Marquette, $210,000; the Reading, $450,000, and the Delaware & Hudson, $300,000. Likewise, the Denver & Rio Grande Western has appropriated $190,000 for the improvement of its water stations, while the Great Northern has set aside $75,000 for the same purpose, the Norfolk & Western $1,500,000, the Northern Pacific $100,000 and the Reading $256,000, which expenditures will be supplemented by $438,000 by another western road.

While it is difficult to present any accurate forecast of the amounts that the railways will spend for new cars and locomotives, because of the unwillingness of many of the roads to indicate their intentions in advance of actual purchase, the information that has been furnished us indicates, as was stated above, that the railways of the United States and Canada will spend more than $300,000,000 for equipment during 1928. The indications are further that this figure will be increased rather than diminished as the year progresses and the trend of traffic becomes more evident. This is borne out by the entrance of several roads into the market for considerable quantities during the closing weeks.

Outstanding among the orders placed late in December were those of the Atchison, Topeka & Santa Fe for 3,650 freight cars and 76 passenger cars, the Southern for 5,500 freight cars and 27 passenger cars, the Louisville & Nashville for 2,150 freight cars and 16 passenger cars, and the Mobile & Ohio for 700 freight cars. In addition, inquiries were also issued by the St. Louis-San Francisco for 4,000 freight cars and 20 passenger cars, by the Pacific Fruit Express for 2,000 refrigerator cars, by the Texas & Pacific for 1,000 freight cars and by the Pennsylvania for 690 passenger train cars.

The Problem of Regulation

(*Continued from page* 13)

The south today is on a broader and more stable economic foundation than ever, and the limits of its possibilities are still beyond the horizon of our present vision.

The continued ease of credit, with the ability readily to finance business undertakings of demonstrable merit, is another favorable factor in the general situation. Another is the prospective recovery in automobile production as a result of announced and pending changes in manufacturers' programs. Finally, but by no means least important, although of a negative nature, is the fact that the dark spots which have appeared in the picture of business the last year are mostly of known causes and causes that may reasonably be expected not to recur. An outstanding example is the devastating flood of 1927.

It is my opinion, therefore, that for as far into the future as it is ever possible to make an intelligent forecast business will feel the beneficial effects of this predominance of favorable elements.

2. The adequacy of expenditures for additions and betterments to railway facilities has ceased to be measured by the annual budgets of the railroads. The view is much sounder which looks to the program undertaken and carried out over a period of years. Through the expenditure of approximately six billion dollars for improvements and extensions since the end of federal control the managements of American railroads have given proof not only of their ability to meet the country's requirements for transportation but of their good faith in the application of reasonable regulation. That record speaks for itself.

Business may have its variable elements and its consequent uncertainties, but its growth over a period of years is a certainty. That makes me a believer in the necessity of growth in the machinery of transportation which serves business. Looking to the future and taking a view which comprehends not one year but a period of years, I am therefore impressed with the need of continued growth in the capacity as well as of continued increase in the efficiency of railway facilities.

3. Will the railroads meet this need? Consideration of this question necessarily involves the further question of the present trend of railway regulation. The managements of the railroads have raised and spent around six billion dollars upon the improvement and extension of their properties since federal control, and they deserve commendation for the faith in which they have carried on this gigantic program. It would seem, however, that the time is at hand when they should expect to see their faith confirmed by an adequate return upon the money they have so courageously invested.

The problem primarily concerns the regulation of railway rates. Laying aside the troublesome questions of valuation and of rate of return upon valuation—which, after all, are not ends of themselves, as some mistakenly believe, but means to an end—the aim of rate regulation should be to give the railroads money enough to pay operating expenses, taxes, fixed charges and dividends, with such a margin remaining as will enable them to accomplish the needful expansion of railway facilities through the reinvestment of earnings and through the raising of new capital. That would still be the problem if there were no stated rule of rate making, and that problem is not being adequately solved at present.

The problem is one of public policy, but it is a problem in the solution of which the railway managements of the country must concern themselves. It is unquestioned that public sentiment is better informed in railway matters and more kindly disposed toward the railroads than for years past. That is splendid, but such sentiment, favorable though it may be, is ineffectual if it is not utilized to support the entirely reasonable demand for constructive rate regulation. Herein is the most important challenge that is made to railway managements today.

A Review of Railway Operations in 1927

Operating efficiency continues to improve but net operating income falls off

By Julius H. Parmelee
Director, Bureau of Railway Economics

RAILWAY managements in 1927 continued their drive toward higher levels of operating efficiency, in the face of declining traffic and revenues. This drive showed very successful results.

Operating performance reached a higher average of efficiency than in 1926. A survey of the various factors of efficient railway operation clearly indicates a progressive gain year by year since 1923, when the railways put into effect a specific program looking to more effective performance. This progressive improvement in efficient operation is primarily the result of the program of 1923, consistently followed during the past five years.

Railway achievement during each of these years can thus be attributed to the conscious development of a program of both individual and co-operative effort. To a greater degree, the same comment applies to the results for 1927. The efficient operation of 1927 was not a fortuitous circumstance, but grew out of a conscious and deliberate effort intelligently applied. The railways since the beginning of 1923 have invested more than four billions of new capital in their properties, have received a fine measure of co-operation from shippers and the general public through the extension of the shippers' advisory board movement, and have continued to receive the loyal support of a large proportion of their employees.

Whatever may be the several causes of improvement in railway efficiency, the most significant feature of that improvement is its effect on the economic welfare of the United States. On this point, testimony is emphatic from all sources.

The latest report of the Secretary of Commerce, for example, first refers to the steady improvement in railway service during the last few years, and adds:

"The chronic car shortages of former years have been overcome. The proportion of rolling equipment in bad order, both cars and locomotives, has been greatly cut down; in this respect the fiscal year 1926-27 marked the most satisfactory situation reported for many years. The tonnage per train has been increased. More important still from the standpoint of the general public welfare, delays in the movement of traffic have been greatly reduced. The expedition of railway service has reacted favorably upon the entire economic structure. It is estimated that the rapidity of freight transportation is now from 30 to 40 per cent greater than at the close of the war."

Thus it is no idle word to say that the railway systems of the United States have contributed effectively, and in no small measure, to our economic progress during the post-war period.

Yet in 1927 their net income fell more than a hundred millions under the previous year, and their rate of return on investment dropped again below that five per cent mark which—although far from adequate—they had finally attained in 1926, after several years of slow rise toward that point.

General Summary of 1927

Railway operations in 1927 may be summarized as follows:

1. A decline of more than two per cent in freight traffic, compared with the peak reached in 1926, and a decline of four per cent in passenger traffic.
2. Total operating revenues lowered by three and a half per cent.
3. Total operating expenses reduced about two per cent, and a slight increase in the operating ratio, which brought it to 74.1 per cent for 1927. This was lower than in any year of the past decade except 1926.
4. Net railway operating income less than in 1926 by nine and a half per cent.
5. A rate of return on property investment for the year of 4.50 per cent. This was lower by one-eighth than in 1926, and was also lower than in 1925.
6. Continued condition of adequate, prompt, and dependable transportation service.
7. Maximum performance in at least thirteen factors of operation, and a high level of attainment in all other factors.
8. An index of general railway efficiency surpassing all previous years.

Railway Traffic in 1927

Freight traffic of the railways of the United States in 1927 fell from two to three per cent below the record level attained in 1926. Except for 1926, however, the traffic of 1927 was greater than in any previous year.

Measured in revenue carloadings, the traffic of 1927 is estimated at approximately 51,500,000 cars. This is three per cent less than in 1926, but 3.4 per cent greater than the next preceding peak of 1923.

In net ton-miles, the estimated total for 1927 was 478 billions. This was about two per cent below 1926, but more than four per cent above 1923.

The passenger-miles in 1927 fell four per cent below 1926, and by greater margins were less than the totals of 1925 and all previous years back to 1916. The almost constant recession in passenger business since 1920 has resulted in a cumulative decline of 27 per cent during the past seven years.

Table I is the basic table from which these comparisons are drawn. The revenue carloading figures are the tabulations of the Car Service Division of the American Railway Association. Net ton-miles are based upon reports of the Interstate Commerce Commission, and include both revenue and non-revenue movement. The passenger-miles are also based upon the reports of the Commission, and include revenue movement only.

All entries for 1927 in the table, and throughout the

remainder of this presentation of statistics, are partially estimated, and will be subject to revision when the final returns for the year become available. All the statistics relate to railways of Class I.

Table I compares the traffic results for the year 1927 with those for 1926, 1925, 1923, and the five-year average from 1922 to 1926. The year 1923 has been included, along with 1925 and the five-year average, because it was a peak year of freight traffic, and with 1926 presents a significant basis of comparison against which the traffic statistics of 1927 may be measured.

Table I—Comparative Traffic Results

Revenue Carloadings		
	1927	51,500,000
	1926	53,100,000
	1925	51,224,000
5-year av.	1922—1926	49,176,000
	1923	49,812,000
Net Ton-Miles		
	1927	478,000,000,000
	1926	488,578,000,000
	1925	456,087,000,000
5-year av.	1922—1926	441,574,000,000
	1923	457,607,000,000
Passenger-Miles		
	1927	34,000,000,000
	1926	35,417,000,000
	1925	35,964,000,000
5-year av.	1922—1926	36,219,000,000
	1923	38,008,000,000

The aggregate of 51,500,000 carloadings in 1927 was a drop below the million-car-a-week average that was reached in 1926, for the first time in railroad history.

During the ten-year period from 1918 to 1927, inclusive, the trend of railway freight traffic has been generally upward. This is especially significant when we recall that the first year of the period was a war year, when traffic took an unusual spurt.

The average weekly loadings for each year of this ten-year period have been as follows:

1918	858,000	1923	958,000
1919	804,000	1924	933,000
1920	868,000	1925	985,000
1921	756,000	1926	1,021,000
1922	831,000	1927	990,000

The net increase for the period as a whole was from a weekly average of 858,000 in 1918 to 990,000 in 1927, or about fifteen per cent. This is one measure of the business expansion of the United States during the past decade. The same expansion may be measured by studying the carloading statistics in terms of the performance during individual weeks and months.

Prior to the year 1920, the freight loadings had never reached a million cars in any single week. That was an unattained, and some thought unattainable, goal. In 1920, however, five million-car weeks were reported. Although there were none in 1921 and 1922, the year 1923 reported 21; in 1924 the number of million-car weeks reported fell to 11; in 1925 the number rose again to 20. The country now began to think of carloadings not in terms of occasional weeks of a million cars each, but of an *average* weekly loading of a million or more.

The million-car average was attained in 1926, and was in fact surpassed by more than 20,000 cars. Twelve weeks in that year went over 1,100,000 cars, and three weeks over 1,200,000. In 1927 the year's average dropped below a million; there were only nine individual weeks above 1,100,000 cars, and none above 1,200,000.

However, there were 28 million-car weeks in 1927, which was a greater number than in any previous year. The first such week came in March, two months earlier than in 1926. This was due to the heavy coal movement in the early spring months. Beginning with May, every week except three holiday weeks recorded a million cars or more, down to and including the first week in November.

As in 1926, a weekly average of one million cars or over was reported for seven of the calendar months of 1927. These months were March and the six months from May to October, inclusive. The highest weekly average was reached in October, with 1,118,000 cars.

As to individual weeks, successive peaks have been recorded from time to time during the past ten years, beginning with a peak of 991,980 cars in 1918, and ending with a much higher peak of 1,208,878 cars in 1926. The peak in 1927 occurred during the week ending October 25, when 1,128,486 cars were reported. This was more than six per cent below the high week of 1926.

Because of the heavy freight traffic during the first half of 1927, which came at the time of year when traffic is usually lightest, and because of the smaller traffic during the second half of 1927, when the traffic is normally heaviest, the loadings were distributed more evenly throughout the year 1927 as a whole than during the preceding year. This is proved by measuring the weekly deviation from the year's average, both for 1927 and 1926. In 1926 this weekly deviation amounted to 84,037 cars, or approximately eight per cent. The deviation in 1927, however, was reduced to 60,330 cars, or approximately six per cent.

While any reduction in average weekly deviation represents a forward step toward greater stabilization of traffic, together with a better and more even distribution, too much emphasis should not be laid upon this factor in 1927, because of the marked difference between the first and second halves of the year with respect to the movement of coal. During the first six months, the number of cars loaded with coal was greater than during the corresponding period of 1926 by more than 300,000 cars. During the second half of the year, however, the number of coal loadings in 1927 was less than during the corresponding six months of 1926 by 945,000 cars. This striking difference between the two halves of the year had no small influence on the evening up of the distribution of the freight traffic over the several weeks of the year.

Trend of Freight Traffic

Attention has already been directed to the great decline in coal loadings during the later months of 1927, as compared with the first half of the year. To a lesser degree, the same trend may be found in other classes of commodities. The result for total carloadings was that the earlier weeks and months of the year showed a consistent increase over the corresponding periods of 1926, that that increase gradually turned into a decrease, and that the decrease showed a rising tendency toward the end of the year.

This fact may be illustrated by comparing the carloadings of the two years in terms of a moving average; that is, a percentage comparison between successive periods of the two years, carried forward from month to month by dropping a month at the beginning of the period and adding another at the end. Making this computation on the basis of an average period of three months, we may compare the first three months of 1927 with the first three months of 1926, then drop January and add April to our comparison, then drop February and add May, and so on through the year. This method irons out the effect of sharp changes that might occur in any one month, and gives a truer picture of the trend through the year than if the comparison were made on a monthly basis.

Table II presents a series of percentage comparisons between 1927 and 1926, based upon a moving average of carloadings by three-month periods.

Table II

COMPARISON OF CARLOADINGS, 1927 AND 1926

	Per Cent Increase in 1927
January-March	I 3.2
February-April	I 3.1
March-May	I 1.5
April-June	D 0.5
May-July	D 3.3
June-August	D 3.9
July-September	D 4.1
August-October	D 4.6
September-November	D 6.6
October-December	D 8.6

The table clearly brings out the declining trend of freight traffic in 1927. Beginning with the first three months, there was an increase over 1926 of more than three per cent. This increase was barely maintained in the next period compared, was then cut in half, and then became a decrease. The decrease steadily rose, period by period, until it exceeded eight per cent for the last three months of the year.

Loadings According to Commodities

Table III distributes the carloadings of 1927 among the eight general groups or classes according to which they are reported by the Car Service Division.

To place the table upon a basis comparable with previous years, the percentage distribution is shown for 1927, and also for 1926 and 1925.

The smaller proportion of coal and coke loadings in 1927 than in 1926 stands out as the significant feature of this table. Combining the two classes, the proportion was 19.9 per cent in 1926, and 18.9 per cent in 1927. Although coal and coke loadings ran ahead of 1926 during the spring, they fell off so greatly in the later months as to make the totals for the year lower than in 1926 by some 700,000 cars.

Less marked changes brought out by Table III are the reduced percentages in 1927 for ore, forest products and live stock. The miscellaneous group of manufactured products, comprising more than three-eighths of the total loadings, showed a relative increase over the proportion of 1926, and small increases were also reported for merchandise and for grain.

Table III

PERCENTAGE DISTRIBUTION OF COMMODITY CARLOADINGS

	1927		1926	1925
	Number	Per cent		
Grain and products	2,369,000	4.60	4.51	4.50
Live stock	1,540,000	2.99	3.01	3.19
Coal	9,172,000	17.81	18.62	17.39
Coke	546,000	1.06	1.30	1.22
Forest products	3,414,000	6.63	6.86	7.30
Ore	1,921,000	3.73	4.10	3.93
Mdse. L. C. L.	13,215,000	25.66	25.24	25.75
Misc.	19,323,000	37.52	36.36	36.72
Total	51,500,000	100.00	100.00	100.00

Freight Ton-Miles

The ton-miles, as well as carloadings, showed a recession in 1927. The total of 478 billion net ton-miles for the year was less by 2.2 per cent than in 1926, but was 4.6 per cent above the total for 1925.

Ton-miles showed a smaller relative decrease in 1927 than did carloadings. This general difference between carloadings and ton-miles, in respect to the rate of decrease in 1927, held generally throughout the year. Every month to and including May reported increases for both factors of freight movement, with the rate of increase in ton-miles always greater than that of carloadings. Every one of the remaining months of the year reported a decline under 1926, with the rate of decrease smaller for ton-miles than for carloadings. The explanation of this difference seems to lie in the larger proportion of coal movement in the spring of 1927 than in 1926, the smaller proportion of coal in the autumn, and the slightly smaller proportion of miscellaneous and merchandise freight in the total of the year.

Chart A shows by months the freight traffic of the year 1927, compared with 1926 and with the five-year average from 1922 to 1926. The two final months of 1927 are partially estimated.

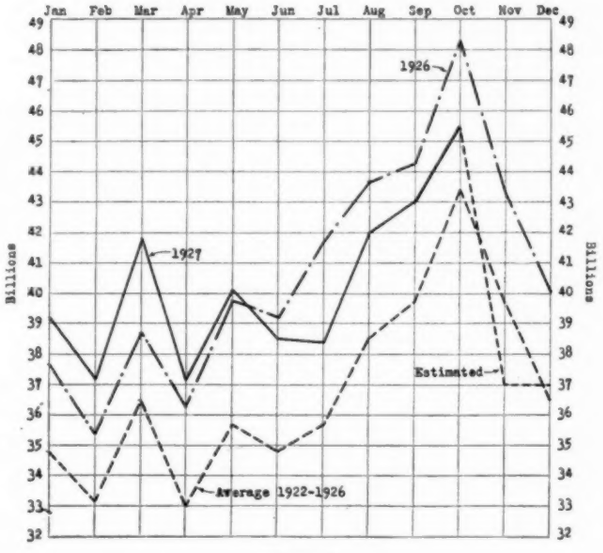


Chart A

Passenger Business Declines

Revenue passenger-miles in 1927 were less by four per cent than in 1926, and fell to a point about 27 per cent below the record level of 1920. In fact, one must turn back to the year ended June 30, 1916, to find a smaller aggregate demand for passenger service than in 1927. All of the increase that occurred between 1916 and 1920 has now been gradually eaten away by the various forms of competition.

Whether the continued decline of 1927 resulted from still fiercer competition than in other years, or whether it partially reflected the "profitless prosperity" of the year, the effect on passenger revenue was to reduce it below a billion dollars, which was the first time this has occurred in a decade.

Chart B strikingly portrays the declining passenger service of 1927, month by month, below the corresponding results of 1926 and even below the average annual levels of the five-year period to 1926.

Financial Results in 1927

With a decline in both freight and passenger traffic during 1927, revenues could not but show a decrease. Total operating revenues amounted to $6,225,000,000 in 1927, which was a decrease of 224 million dollars, or 3.5 per cent, under 1926.

The aggregate of operating expenses in 1927 was $4,610,000,000, which was a reduction of 105 million dollars, or 2.2 per cent. Operating expenses last year were less than in 1926, 1923, and 1920, but were greater than in any other previous year.

The operating ratio, or percentage relationship between revenues and expenses, showed an increase

over 1926, rising from 73.1 to 74.1 per cent. This ratio progressively declined each year from 1920 to 1926, but turned upward again in 1927. The lowest ratio attained in the ten years to 1927 was the average of 73.1 per cent reported for 1926.

Railway taxes paid in 1927 amounted to $388,000,000, a decrease of six million dollars under 1926. This reduction is more than explained by the decline in railway gross and net earnings during the year. Tax accruals are set up on railway books with an eye on the current net income, and when that net income is falling, the tax accruals will also decline. This is particularly true in the case of the Federal income tax of 13½ per cent, and is also true of many state and local taxes which are levied on the basis of gross or net earnings, or both. All other railway taxes than those levied on their income showed a considerable increase during 1927.

Total net railway operating income for 1927 is estimated at $1,115,000,000. This was a decrease of 117 million dollars, or 9.5 per cent, under 1926. It was also less than the net income of 1925 by 24 millions.

The rate of return on investment, which is the significant measure of the financial results of the year, showed an even greater relative decrease, dropping from 5.13 per cent in 1926 to 4.50 per cent in 1927. This was a decline of about one-eighth, whereas the amount of net income fell about one-tenth. As the total railway investment in 1927 was greater than in 1926, it is clear that any given reduction in net income would mean an even greater reduction in the rate of return.

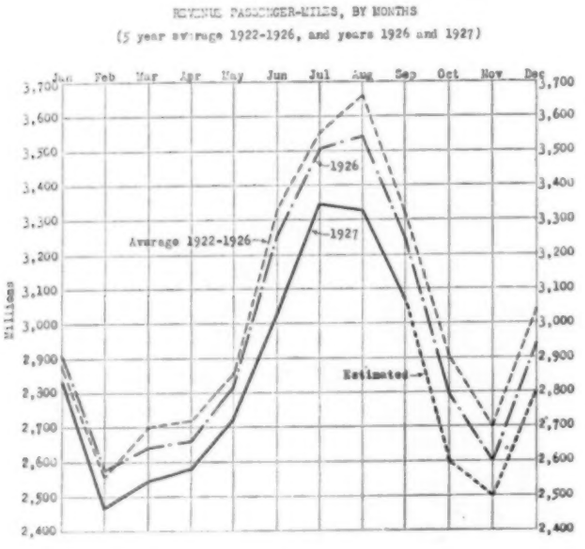


Chart B

The average annual rate of return for the five years to 1926 was 4.50 per cent, which was the same rate as that of 1927. While there has been some improvement in the rate since 1920, the return of 4.50 per cent on investment in 1927 was below that earned in both 1925 and 1926, and is not a feature of the year's operations that offers great encouragement for the future. These highly significant measures of the financial results of the past eight years, or from 1920 to 1927, are given below.

	Rate of return on Investment		Rate of return on investment
1920	0.09%	1924	4.33%
1921	2.92%	1925	4.85%
1922	3.61%	1926	5.13%
1923	4.48%	1927	4.50%

Compared with a rate of return of 4.50 per cent for the United States as a whole, the rates for the three districts in 1927 were approximately as follows: East, 5 per cent; South, 4.45 per cent, and West, 4 per cent.

Table IV summarizes the revenues, expenses, taxes, net operating income, and rate of return, comparing the year 1927 with 1926 and the five-year period 1922 to 1926.

Table IV

CONDENSED INCOME ACCOUNT

	1927 (millions)	1926 (millions)	Five-year aver. 1922-1926 (millions)
Total operating revenues	$6,225	$6,449	$6,121
Total operating expenses	4,610	4,715	4,652
Taxes	388	394	349
Net operating income	1,115	1,232	1,024
Return on property investment	4.50	5.13	4.50

Operating Revenues

Aggregate operating revenues declined 3.5 per cent under 1926, but were 1.7 per cent above the preceding five-year average.

Table V is a summary of the component items of operating revenue, the returns for 1927 being compared with those of 1926 and of the five-year period for the years 1922 to 1926, inclusive.

Table V

RAILWAY OPERATING REVENUE

	1927 (millions)	1926 (millions)	Five-year aver. 1922-1926 (millions)
Freight revenue	$4,670	$4,809	$4,469
Passenger revenue	977	1,043	1,080
Mail revenue	93	96	95
Express revenue	137	149	147
All other revenue	348	352	330
Total	$6,225	$6,449	$6,121

Every class of railway revenue declined in 1927. The greatest relative decrease occurred in express revenue, which fell off eight per cent. Passenger revenue declined about six per cent. Freight revenue showed the greatest amount of decrease, the decline being 139 million dollars, or nearly three per cent. Mail revenue fell off about three per cent, while miscellaneous or "all other" revenues showed a decrease of one per cent.

Compared against the five-year averages, freight revenue in 1927 showed an increase, while the remaining items, except the "all other" group, declined.

Operating Expenses

Aggregate operating expenses were reduced 105 million dollars under 1926, or 2.2 per cent. The decrease under the annual average of the preceding five-year period was slightly less than one per cent.

Table VI summarizes the various items of operating expense in 1927, compared with 1926 and the average of the five years.

Table VI

RAILWAY OPERATING EXPENSES

	1927 (millions)	1926 (millions)	Five-year aver. 1922-1926 (millions)
Maintenance of way	$880	$874	$812
Maintenance of equipment	1,225	1,292	1,313
Traffic	120	115	100
Transportation	2,157	2,209	2,217
General and other	228	225	210
Total	$4,610	$4,715	$4,652

Some of the classes of expense increased in 1927, and some declined. Maintenance of equipment showed the greatest reduction, both in amount and percentage. Although maintenance of way increased slightly, the two maintenance accounts combined were below the returns for 1926 by 61 million dollars, or 2.8 per cent.

The other important item in this group, transportation expenses, declined 2.4 per cent. General and other expenses increased 1.4 per cent, while traffic expenses increased 4.6 per cent.

Comparing 1927 with the five-year average, the two largest items of transportation and maintenance of equipment expenses showed decreases, while the other items increased.

Receipts Per Traffic Unit

Railway revenues declined in 1927, in all branches of the service. So far as the freight and passenger services were concerned, the decrease in revenue was relatively greater than the actual decline in traffic. Respecting the other services, known factors do not exist by which to measure the physical amount of the service rendered.

The number of ton-miles fell off two per cent in 1927, while freight revenue declined three per cent. Passenger-miles decreased four per cent, and passenger revenue six per cent. The answer to these apparent discrepancies lies in the declining price of transportation in 1927, that is, what the public paid the railways per transportation unit. In both the freight and the passenger service, average receipts per unit were lower in 1927 than in any previous year since 1920.

The average receipts per ton-mile and passenger-mile, year by year from 1921 to 1927, are presented in Table VII. These averages are the respective price levels of the two principal kinds of transportation service rendered by the railways.

Table VII

RECEIPTS PER TON-MILE AND PASSENGER-MILE, 1921-1927

	Receipts per ton-mile (cents)	Receipts per passenger-mile (cents)
1921	1.275	3.086
1922	1.177	3.027
1923	1.116	3.018
1924	1.116	2.978
1925	1.097	2.938
1926	1.081	2.936
1927	1.075	2.900
Per cent decrease:		
1927 under 1926	0.6	1.2
1927 under 1921	15.7	6.0

Receipts per ton-mile in 1927 averaged 1.075 cents, which represented a reduction of six-tenths of one per cent. This reduction, added to the reductions of earlier years, brought the average for 1927 to a point nearly sixteen per cent below 1921, the year of highest post-war averages.

Similarly, average receipts per passenger-mile for 1927 were about one per cent below 1926, and six per cent below 1921.

Capital Expenditures

Railway capital expenditures have played a highly significant part in the now historic program of the railways, which since 1923 has effected many improvements in plant and operations. These expenditures have enabled a rehabilitation of equipment, and have provided many new additions to roadway, tracks, and yard facilities.

The gross capital expenditures of the railways during the past five years have been as follows:

1923	$1,059,000,000	1926	885,000,000
1924	875,000,000	1927	750,000,000
1925	748,000,000		
		Total	$4,317,000,000

Thus the aggregate expenditure of new capital during the past five years has amounted to nearly four and one-third billions of dollars, an annual average of more than $860,000,000 per year. The cumulative effect of these expenditures on railway efficiency, which will be described later, can hardly be over-emphasized.

Unexpended authorizations of capital expenditures for improvement purposes were brought over from 1926 into 1927, in the amount of $375,000,000. Additional authorizations during 1927, aggregating some $765,000,000, brought the grand total of authorized expenditures under way during the year to $1,140,000,000. Actual expenditures during the year were $750,000,000, leaving a carry-over of $390,000,000 into 1928.

The estimated capital expenditures in 1927 are detailed in Table VIII.

Table VIII

CAPITAL EXPENDITURES IN 1927

Locomotives	$71,000,000
Freight-train cars	137,000,000
Passenger-train cars	41,000,000
Other equipment	20,000,000
Additional track	142,000,000
Heavier rail	46,000,000
Additional ballast	14,000,000
Shops, engine houses and machinery	37,000,000
All other improvements	242,000,000
Total	$750,000,000

Of this estimated total of $750,000,000 expended for capital improvements in 1927, $269,000,000 was apportioned to new equipment, while the remaining $481,000,000 went into roadway and structures. The proportions were 36 per cent for equipment and 64 per cent for roadway.

The proportion of total capital expenditures devoted to the purchase of new equipment declined steadily from 1923 to 1927. This proportion, which was 64 per cent in 1923, fell year by year to 42 per cent in 1926, and to 36 per cent in 1927. For the five years as a whole, however, capital expenditures were divided very evenly between equipment on the one hand and roadway and structures on the other hand, the respective five-year totals being 2,155 million dollars for equipment and 2,163 millions for roadway.

Locomotive and car installations were fewer in 1927 than during 1926. Comparing the first eleven months of each year, the aggregates were 1,820 locomotives in 1927, and 2,193 in 1926. Corresponding totals for freight cars were 67,985 in 1927 and 92,368 in 1926. Passenger car installations for nine months aggregated 1,851 units in 1927, and 2,260 in 1926.

Retirements during the first eleven months of 1927 numbered 3,194 locomotives and 82,435 freight cars. For nine months, 2,395 passenger cars were retired.

The new locomotives placed in service in 1927 averaged 50,656 pounds of tractive effort, whereas the retired locomotives averaged only 31,304 pounds. As a result, although unit retirements were nearly twice as great as installations, the aggregate tractive power of the new units almost equalled that of the retired units, and the average power of the locomotives in use increased from 41,783 pounds per locomotive at the end of 1926 to 42,589 pounds on November 30, 1927.

Although fewer new freight cars were installed during 1927 than in 1926, there was a continued trend both toward greater average and greater aggregate capacity. The new freight cars placed in service in 1927 had an average capacity of 49 tons, whereas the units retired averaged only 37½ tons. The net result was an increase in the aggregate capacity of all freight cars in service, while the average capacity per car rose from 45.3 tons at the close of 1926 to 45.6 tons on November 30.

Statistics of unfilled orders for new equipment showed a marked reduction in 1927. Locomotives on order at the end of November were reported as 69, compared with 344 on the same date in 1926, while the number of freight cars on order was 9,921, compared with 11,591 in 1926. Passenger cars on order at the end of September fell off from 766 in 1926 to 709 in 1927.

Reserve Equipment

During the past four years the railways have handled a large freight traffic with at all times a reserve fund of motive power and of freight cars. In fact, the traffic of these four years has been greater than in any other four years of railway history, and the amount of equipment in reserve at the same time has also been greater than ever before. While the traffic in 1927 was somewhat less than in 1926, the reserve or surplus of motive power and of freight car capacity increased by

a much greater margin than would be explained by the smaller traffic.

Tables IX and X summarize the situation as to reserve equipment. They show, for the first of each month from January to December, 1927, the number of stored locomotives and surplus freight cars, respectively. Comparisons are made with 1926 and also with the five-year average to 1926.

Table IX is the summary of the number of stored locomotives, in good condition and potentially ready for service at any time.

Table IX

STORED SERVICEABLE LOCOMOTIVES, FIRST DAY OF EACH MONTH

	1927	1926	Average 1922-1926
January	4,601	5,166	4,567
February	4,666	5,048	4,042
March	5,124	4,839	3,974
April	5,792	5,370	4,543
May	6,212	5,918	5,528
June	6,320	5,913	5,573
July	6,219	5,909	5,628
August	6,663	5,642	5,219
September	6,251	5,432	4,730
October	5,720	4,680	3,912
November	5,520	4,102	3,320
December	6,695	4,052	3,530

The number of stored locomotives in 1927 ranged from a minimum of 4,600, on January 15 (a date not included in Table IX) to a maximum of 6,663, on August 1. Both this minimum and this maximum were higher than the corresponding extremes of 1926, which were 3,841 and 5,978, respectively. The extremes reported in 1926 occurred on other dates than the first of the month, and do not appear in the table.

While these statistics of minimum and maximum are significant, they do not tell the story of the potential

STORED SERVICEABLE LOCOMOTIVES, ON 1ST OF EACH MONTH

(5 year average 1922-1926, and years 1926 and 1927)

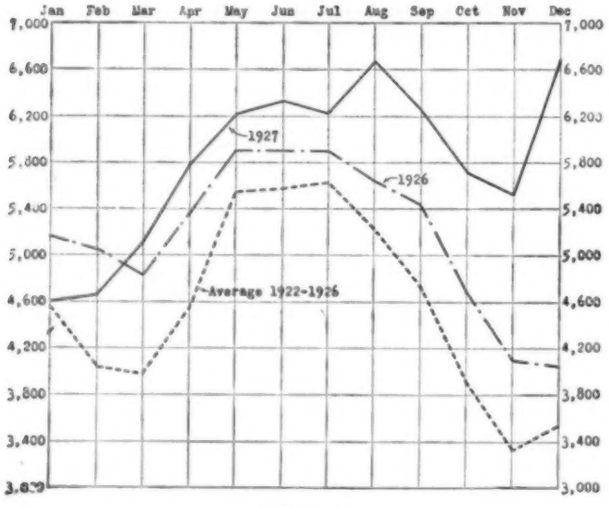


Chart C

reserve of motive power for the haulage of freight and passengers so fully as the averages of the respective periods. On this basis, too, the year 1927 stands out above 1926 and the five years. The average number of stored locomotives in 1927 (eleven months) was 5,788, compared with 5,123 during the year 1926, and an average of 4,523 for the five-year period. This large number of lomotives in storage during 1927, which ranged 13 per cent above the average for 1926, was a continued guarantee on the part of the railways that the transportation needs of the public were being protected by an adequate margin of motive power.

Chart C is the graphic statement that corresponds to Table IX. Except at the beginning of the year, the curve for 1927 ran well above that for 1926, and the spread increased to more than 2,600 locomotives in December. Compared with the five-year average, there was a margin in favor of 1927 at all times, and this margin or spread increased materially toward the end of the year.

Table X tells the same story for surplus freight cars, in good physical condition. This statement relates to cars reported as idle, or surplus, during the first week of each month in 1927, 1926, and the average for five years. These statistics are reported for four periods per month, averaging about a week each.

Table X

FREIGHT CAR SURPLUS, FIRST WEEK OF EACH MONTH

	1927	1926	Average 1922-1926
January	326,837	310,155	256,457
February	257,767	240,424	178,562
March	267,616	202,432	190,129
April	254,095	274,219	255,822
May	245,113	270,385	254,639
June	274,062	270,841	250,614
July	282,559	239,167	230,583
August	254,324	179,771	166,970
September	175,704	141,096	102,886
October	142,678	100,069	68,776
November	207,757	88,130	96,313
December	385,748	164,580	176,784

The number of surplus cars ranged from a minimum of 135,059 in October (middle of the month) to a maximum of 385,748 in December. Both these extremes were above the corresponding extremes of 1926, which were 79,016 and 310,155, respectively; neither of the extremes for 1926 appears in the table, as they occurred in other weeks than the first week of the month.

As in the case of locomotives, greater significance attaches to statistics of the average reserve of freight cars than to those of the minimum and maximum. The average number of freight cars reported as surplus during 1927 (to December 7) was 247,305, compared with a surplus of 209,644 cars during 1926, and 186,225 cars during the five years. The superiority of 1927 in this respect is clear, the average running 18 per cent above that for 1926.

This same superiority is brought out in Chart D, which

AVERAGE DAILY FREIGHT CAR SURPLUS, BY MONTHS

(5 year average 1922-1926, and years 1926 and 1927)

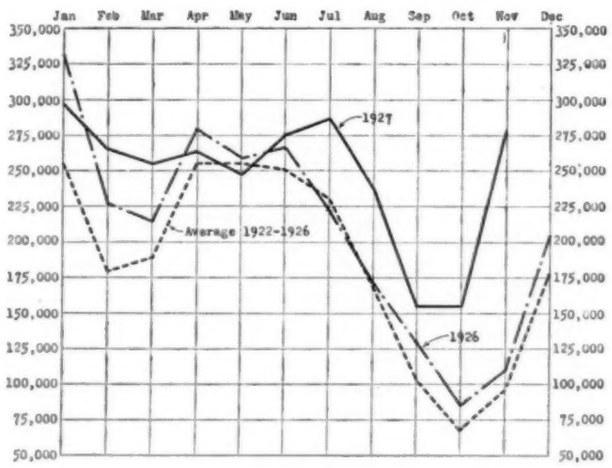


Chart D

gives the average daily freight car surplus during each month of 1927, 1926, and the five years.

Closely related to statistics of freight car surplus are those dealing with freight car shortage. As the surplus, or reserve, of cars ran unusually high in 1927, so did the shortage run unusually low.

Car shortages were generally smaller in 1927 than in

any recent year. These shortage reports, like those of surplus, are made four times per month. Of 45 compilations so made through the first week in December, nine carried a story of no shortage whatever. There was no shortage of cars throughout the whole month of June. When the aggregate loading of nearly 4,000,000 cars of freight in that month is considered, this complete absence of even one unfilled car order from any shipper constitutes a really remarkable railroad achievement. The largest shortage reported at any time in 1927 was 2,151 cars; the next largest was 775; all others fell below 700. In fifteen weeks shortages of less than 100 cars were reported.

The average shortage reported for the year 1927 was 183 cars, compared with corresponding averages of 286 cars in 1926 and 443 cars in 1925. An average shortage of 183 freight cars is a negligible item in the 2,300,000 cars daily passing from carrier to shipper and from shipper to carrier.

Railway Operating Efficiency

The operating efficiency of the railways of the United States reached a new high level in 1927. Many of the factors of efficiency broke all records, while all the others compared favorably with any other year.

These high levels attained by the railways in 1927, as already pointed out, were another forward step in the program of progressive improvement of railway operations, under way since the beginning of 1923.

The tables and charts already presented with respect to reserve motive power and freight car capacity, and the virtual disappearance of freight car shortage, have indicated one phase of railway efficiency during 1927. These statistics of reserve equipment should be considered in relation to the physical condition of the equipment actually at work. It will be recalled that stored locomotives and surplus freight cars are all in good condition and serviceable. Statistics of unserviceable locomotives and cars therefore deal with equipment that is in active service.

PERCENTAGE OF LOCOMOTIVES IN SERVICEABLE CONDITION ON FIRST OF EACH MONTH AND PERCENTAGE OF FREIGHT CARS IN SERVICEABLE CONDITION, BY MONTHS
(5 year average 1922-1926, and year 1927)

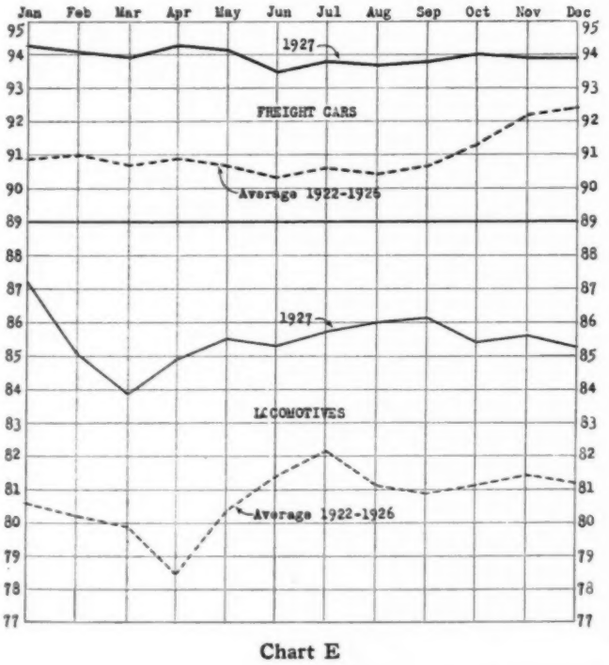


Chart E

Chart E pictures the proportion of equipment reported during each month as serviceable. It relates to both locomotives and freight cars, and compares 1927 with the five-year average to 1926.

The lower half of Chart E presents a graphic picture of the percentage of locomotives in serviceable condition during each month of 1927, compared with the five-year average. The upper half of the chart presents a similar picture for freight cars. Both the curves for 1927 run consistently above the corresponding five-year curves, this being especially true in the case of locomotives.

In fact, the proportion of equipment in good condition during 1927 was, generally speaking, higher than in any year since the war. During the first ten months of the year, the percentage both of serviceable locomotives and of freight cars was higher than in any corresponding period of the past seven years. This was another phase of railway efficiency in which record levels were attained in 1927.

Freight Car Movement

Having considered the number of locomotives and cars available for service, and the number held in reserve, the next step is to appraise the effectiveness with which equipment was handled. Taking up the story first for freight cars, Table XI gives statistics as to miles per freight car per day. Averages are presented for each month of 1927 to October, and by months for 1926 and the five years.

Table XI

MILES PER FREIGHT CAR PER DAY, BY MONTHS

	1927	1926	Average 1922-1926
January	28.5	27.6	25.0
February	30.4	28.6	26.2
March	30.9	29.2	26.8
April	29.5	29.0	26.1
May	30.2	29.8	26.8
June	30.0	30.1	27.0
July	29.1	30.5	26.5
August	30.9	31.5	27.5
September	32.6	32.7	29.1
October	34.7	34.3	30.9
November	...	32.1	29.6
December	...	29.3	26.7

MILES PER FREIGHT CAR PER DAY, BY MONTHS
(5 year average 1922-1926, and years 1926 and 1927)

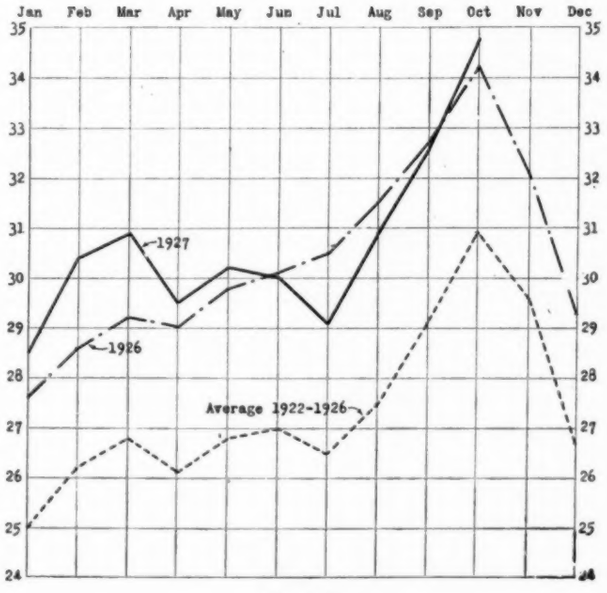


Chart F

The average daily car movement was higher in six

out of the first ten months of 1927 than during the corresponding months of 1926. Seven of these months equalled or surpassed an average of thirty miles per day, a record level of 34.7 miles being reached in October. The average for the year 1927 also surpassed thirty miles, the average for the first ten months being 30.7 miles, compared with 30.4 miles during the corresponding period of 1926. Compared with the five-year average, the averages for 1927 were higher in every month.

In two consecutive years, 1926 and 1927, the railways have not only passed the goal of 30 miles per day which they set for themselves in 1923, but have maintained that or a better average quite consistently throughout the several months of each year. This is another record achievement for 1927.

Chart F indicates in graphic form the improvement that took place during the earlier and later months of 1927 with respect to car movement. Compared with the five-year average, the results for 1927 become even more striking.

In considering the average freight car movement, as portrayed in Table XI and Chart F, it should be recalled that this average is computed by dividing the total number of freight car-miles by the total number of freight cars, including idle or surplus cars, cars in or awaiting shop, and cars in the hands of shippers for loading and unloading. These averages do not indicate the average movement of freight cars while actually in motion, but merely represent the average number of miles made each calendar day in the year by all cars in the railway service on that day.

Some years may report a larger or smaller number of cars in shop, and a larger or smaller number of idle cars, than other years. Differences of this type tend to vitiate comparisons between years, and to penalize the actual accomplishments of the railways in those years when large surpluses are on hand. To obviate such a manifest injustice, comparisons can be reduced to the basis of the average daily movement of what may be called "active" cars, that is, cars not reported as idle or as unserviceable. This eliminates cars awaiting or undergoing shop repairs, and also eliminates idle or surplus equipment, but does not eliminate cars in the hands of shippers.

Applying this revised basis of comparison to the average car movement in 1927, it appears that the mileage per active car per day during the first ten months of 1927 was 36.4 miles, compared with 35.9 miles in 1926. On the same basis, the average attained during the month of October was 39.5 miles, which was the highest on record.

Locomotive Movement

We may now turn to the question of the effective handling of locomotives, both in the freight and passenger service, which is also a significant factor of railway efficiency. The mileage per freight locomotive day during the first ten months of 1927 averaged 61.3 miles, compared with 61.4 miles for the corresponding period of 1926, and 57.6 miles in 1925.

Table XII

LOCOMOTIVE-MILES PER FREIGHT LOCOMOTIVE DAY, BY MONTHS

	1927	1926	Average 1922-1926
January	61.1	59.7	56.4
February	62.1	61.2	57.8
March	61.8	60.7	57.2
April	59.3	59.0	54.4
May	59.8	59.1	55.0
June	59.4	59.4	55.3
July	57.8	60.4	54.6
August	61.0	61.4	56.4
September	64.3	64.9	60.0
October	66.9	67.5	63.4
November	...	65.5	61.7
December	...	63.0	58.6

Table XII gives the statistics by months for 1927, 1926, and the five-year average.

As in the case of freight cars, the averages of freight locomotive-miles per day appearing in Table XII were computed on a basis that included locomotives in or awaiting shop, and stored or surplus locomotives. These averages may be revised in the same way as already suggested for freight cars, by omitting stored and unserviceable locomotives, and placing the computation on the basis of "active" locomotives only. On this basis, the average number of miles per freight locomotive day in 1927 (ten months) was 85.8 miles, compared with 85.1 miles during the corresponding period of 1926, and a five-year average of 81.5 miles.

While this factor of efficiency did not break the record in 1927, the averages for that year being slightly below those for the year 1920, yet the year's achievement ran very close to record levels.

Passenger locomotive performance did reach a maximum level in 1927. The average mileage per passenger locomotive day for the first ten months of 1927 was 114.4 miles, compared with 113.5 miles during the corresponding period of 1926, and 110.1 miles in 1925. All records for a single month were broken in August, 1927, when an average of 117.1 miles was reached.

Freight Train Loading

Another efficiency record was smashed by the railways in 1927, when they reported the greatest average freight train load. Table XIII presents the statistics of train load, or "net tons per train," for the several months of 1927, 1926, and the five-year average to 1926.

Table XIII

NET TONS PER TRAIN, BY MONTHS

	1927	1926	Average 1922-1926
January	748	720	684
February	772	736	702
March	785	728	710
April	754	725	691
May	787	771	718
June	785	780	723
July	782	793	726
August	813	820	759
September	819	816	761
October	805	829	763
November	...	793	742
December	...	745	699

The average trainload was greater in seven of the

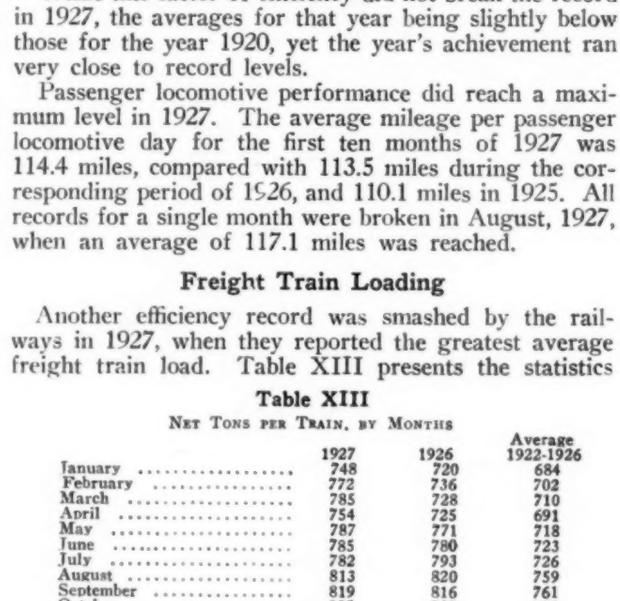


Chart G

first ten months of 1927 than for the corresponding months of 1926, and in every month was above the five-year average. For the first ten months combined, an average trainload of 785 tons was reported, which ran 12 tons above 1926, and 39 tons above 1925. This result was in spite of a heavy decline in coal movement during 1927. The number of cars per freight train averaged 46.7 cars during the first ten months of 1927, compared with 45.3 cars for the same months of 1926.

Chart G graphically shows the trend of trainload averages during 1927, 1926, and the five years, by months.

While the superiority of 1927 over 1926 was especially marked during the first five months of the year, every other month except October was not far behind, all of the months to September being above or close to previous maximum trainload averages.

Freight-Car Loading

The average load per freight car in 1927 (ten months) was the same as in 1926, and three-tenths of a ton greater than in 1925. The average in 1927 was 27.2 tons, while the five-year average to 1926 was 27.2 tons. In this particular respect, therefore, the year 1927 barely held its own with earlier years.

Table XIV gives the monthly figures, which indicate that five of the first ten months in 1927 showed improvement over 1926.

Table XIV

NET TONS PER LOADED CAR, BY MONTHS

	1927	1926	Average 1922-1926
January	28.4	27.6	28.0
February	28.0	27.2	27.7
March	27.4	26.4	26.9
April	26.2	26.1	26.0
May	26.9	26.8	26.6
June	27.0	27.3	26.9
July	27.0	27.6	27.0
August	27.6	27.9	27.5
September	27.2	27.3	27.2
October	26.5	27.5	27.2
November	...	28.5	27.6
December	...	28.7	27.9

Heavier loading of railway freight cars is an unquestioned desideratum. It has been the subject of much discussion at meetings of shippers' advisory boards, and many individual shippers have co-operated with the railways to increase the load placed in the car. The statistical record indicates that the average is still some distance below the goal of 30 tons per car which formed an item in the 1923 efficiency program, although some progress is being made. A recent report of the Car Service Division states that the campaign for heavier loading of cars is definitely gaining headway. For achievement in this field, the railways must look largely to individual shippers for assistance and co-operation.

Net Ton-Miles per Car-Day

Another significant factor of operating efficiency, which combines the two elements of the load in the car and the speed at which a freight car moves, is that showing the average number of net ton-miles per freight car-day.

Table XV gives statistics for this factor, for the first ten months of 1927, and for the several months of 1926 and the five years.

Table XV

NET TON-MILES PER CAR-DAY

	1927	1926	Five-year aver. 1922-1926
January	501	483	452
February	529	502	475
March	537	496	475
April	492	481	443
May	516	511	465
June	512	521	469
July	493	535	464
August	538	558	498
September	569	584	528
October	587	616	558
November	...	573	528
December	...	511	471

The average was 527 ton-miles per car-day during the first ten months of 1927, which was two miles under the corresponding average of 1926, but higher than in any year prior to 1926. The five-year average was 486 miles.

Ton-Miles per Train-Hour

Still another factor of efficiency that combines loading and speed is the number of ton-miles per freight train hour. In this case, the train is taken as the unit, rather than the car.

Table XVI presents statistics covering this factor, by months in 1927, 1926, and the five years.

Table XVI

NET TON-MILES PER TRAIN-HOUR, BY MONTHS

	1927	1926	Average 1922-1926
January	8,903	8,432	7,688
February	9,310	8,547	7,863
March	9,574	8,596	8,056
April	9,292	8,790	8,069
May	9,838	9,522	8,526
June	9,858	9,587	8,569
July	9,887	9,703	8,557
August	9,911	9,865	8,737
September	9,967	9,676	8,656
October	9,961	9,755	8,570
November	....	9,221	8,336
December	....	8,691	7,886

This table presents a story of rare achievement in 1927.

Every possible record was broken during the year. The high mark for a single month was raised from the 9,865 ton-miles per train-hour previously reached (August, 1926) to 9,967 ton-miles in September, 1927. The average for the first ten months of 1927 was 9,652 ton-miles, compared with 9,254 for 1926, which itself was a record to that date. Not only that, but the average for each single month of 1927 was greater than for the corresponding month of any previous year.

Average freight train speed, which is an important element in this factor of ton-miles per train-hour, maintained a monthly average of 12.3 miles during the first ten months of 1927, which was three-tenths of a mile above 1926, and half a mile above 1925.

Chart H gives the number of net ton-miles per train-hour for each month of 1927, compared with 1926 and with the five-year average.

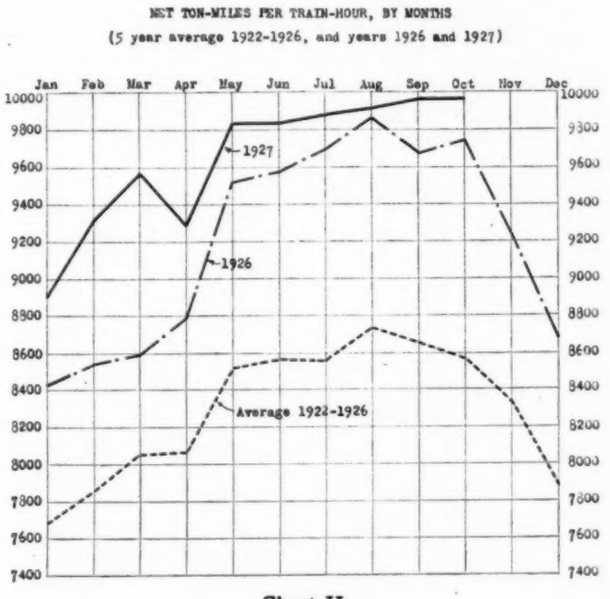


Chart H

The superiority of the performance of the railways in this field during the year 1927 is clearly brought out in this chart. The averages surpassed all of the previous

records in every one of the months of the year.

A similar measure of efficiency is the average number of gross ton-miles per train-hour, which includes the weight of the car, as well as the weight of the load in the car. From the purely operating point of view, gross ton-miles present a better measure than net ton-miles. Whether it is so good a measure of effective and economical service to the public is another question. Be that as it may, gross ton-miles per train-hour also broke every record in 1927—for each month, for any one single month, and for the year as a whole. The average for ten months was 22,017 gross ton-miles per train-hour in 1927, compared with 20,834 ton-miles in 1926, and 19,778 in 1925.

Fuel Conservation

Certain efficiency factors, dealing with fuel consumption by locomotives, involve direct results in the way of economy, as well as physical performance.

New records were reached with respect to fuel consumption in 1927, both in the freight and the passenger service.

Table XVII presents the average consumption of fuel by locomotives in freight service, shown in pounds of fuel per 1,000 gross ton-miles, by months in 1927, 1926, and the five-year period.

Table XVII

POUNDS OF FUEL PER 1,000 GROSS TON-MILES (INCLUDING LOCOMOTIVES AND TENDER), BY MONTHS

	1927	1926	Average 1922-1926
January	153	158	173
February	142	153	169
March	136	150	161
April	132	140	151
May	125	128	141
June	121	124	135
July	118	121	134
August	118	121	134
September	119	125	138
October	124	130	145
November	...	143	155
December	...	153	166

Every month of 1927 shown broke a record, with the lowest—that is, the best—fuel performance of any corresponding month in any year. For the ten months to October, the average was 129 pounds per 1,000 gross ton-miles, compared with 134 pounds in 1926 and 138 pounds in 1925. The low figure of 118 pounds per 1,000 gross ton-miles reported for July and August was the best record of any one month in railroad history.

Corresponding statistics of locomotive fuel consumption in the passenger service appear in Table XVIII.

Table XVIII

POUNDS OF FUEL PER PASSENGER TRAIN CAR-MILE, BY MONTHS

	1927	1926	Average 1922-1926
January	17.4	17.7	19.2
February	16.8	17.6	19.1
March	16.3	17.1	18.3
April	15.6	16.2	17.1
May	15.0	15.1	16.3
June	14.4	14.7	15.5
July	14.0	14.3	15.3
August	14.1	14.3	15.4
September	14.2	14.6	15.7
October	14.9	15.4	16.6
November	...	16.5	17.4
December	...	17.0	18.0

As in the freight service, every month of 1927 reported a record-breaking achievement with respect to fuel conservation in the passenger service. The average amount of fuel consumed per passenger train car-mile was 15.2 pounds during the first ten months of 1927, compared with 15.6 pounds in 1926, and 15.9 pounds in 1925. The low record for a single month was reached in July, 1927, when the average was 14.0 pounds per car-mile.

These savings in the use of fuel per unit of traffic, in the freight and passenger services combined, meant a reduction in aggregate locomotive fuel consumption, during the first ten months of 1927 compared with 1926, of more than 3,200,000 short tons.

An Index of Railway Efficiency

We have been discussing a number of factors of efficient railway operation, and have seen that all of them were on a high level during the year 1927. Some of them, in fact, attained record proportions during the year. No less than thirteen factors of efficiency, in both the freight and passenger service, broke the record in 1927; several of these have already been analyzed, while others could not be discussed within the limits of a brief survey.

It is difficult to bring these various factors together into one picture, in such a way as to measure the progressive improvement of the railways during recent years toward a higher and higher standard of performance. The problem is one of creating an index, or bench mark, according to which all the efficiency factors may be measured together.

There is no easy solution to this problem, but one method of approach is to take each efficiency factor separately, to compute an index number for that factor by relating it on a percentage basis to some previous level, and then to combine all the indexes computed for the different factors into a common or average index.

Chart I graphically portrays the result of such a computation. It is based upon the index numbers of thirteen efficiency factors, for each of which a separate relative index has been found, using the average of the five years from 1920 to 1924 as a base, or 100 per cent. The index has been computed for each factor for each month of the year, the result for January being compared with the average for the five Januaries of the base years, the results for February with the five Februaries, and so for the other months. The thirteen indexes for any one month have been averaged together, to produce a composite index for all the factors for that month.

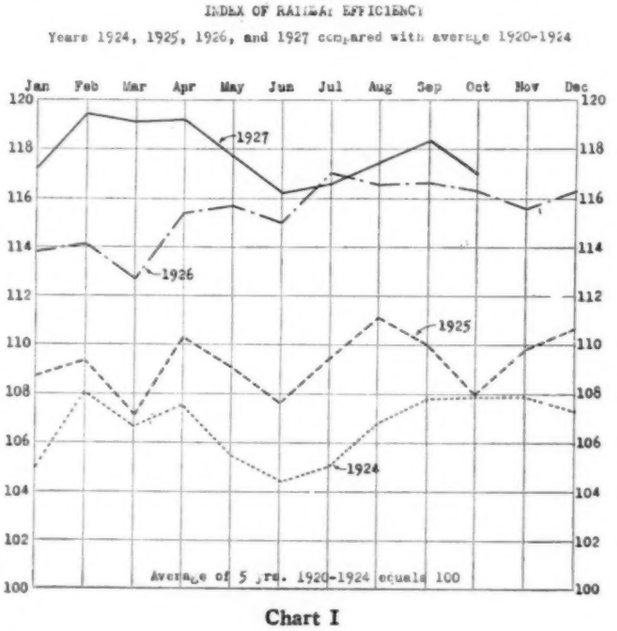


Chart I

Chart I indicates the two outstanding features of the year 1927, as regards the efficiency of railway operation. The first is that the general efficiency index of the railways was higher in almost every month than in any previous year shown, and ran considerably higher in all months than the base line representing the average of the years 1920 to 1924. Second, a progressive in-

crease occurred year by year from 1924 to 1927, the cumulative effect of the efficiency railway program of 1923, as it has been carried out year by year during the past four years.

The highest relative point reached by this index was in February, 1927, when the composite index stood at 119.4; that is, the efficiency in that month was on a level 19.4 per cent higher than during the five-year period. The composite index was almost as high in March and April, declined to 116.2 in June, then showed a general rise to 117 in October.

The significance of the showing in this chart seems clear. It supports the statement already made and repeated several times, that the year 1927 will rank high in the annals of railway efficiency in the United States. It also brings out in emphatic and unmistakable fashion the cumulative progress made by the railways during the past few years.

The thirteen factors that underlie this index of railway efficiency are given below. They should not be confused with the thirteen record-breaking factors mentioned above. The fact that in 1927 both groups contained thirteen items is a mere coincidence.

1. Car miles per car day.
2. Ton-miles per car day.
3. Gross tons per train.
4. Net tons per train.
5. Gross ton-miles per train hour.
6. Net ton-miles per train hour.
7. Locomotive-miles per locomotive day. (Freight)
8. Locomotive-miles per locomotive day. (Passenger)
9. Percentage serviceable locomotives (Freight)
10. Percentage serviceable locomotives (Passenger)
11. Percentage serviceable freight cars.
12. Fuel consumption per unit. (Freight)
13. Fuel consumption per unit. (Passenger)

This list of thirteen factors of performance, selected as the basis of a general index of railway efficiency, includes averages for both the freight and passenger service. It is designed to give such weight to the various elements of speed, loading, car handling, condition of equipment, and fuel utilization, as will produce a reasonably accurate measure of effective railroad operation.

Wages and Hours of Employees

During the first six months of 1927 the number of railway employees averaged nearly one per cent less than during the first half of 1926. Owing principally to the heavy decline in traffic during the last six months, the number of employees fell off more heavily, resulting in a reduction of nearly three per cent during the second half of the year.

The final result was that the average number employed throughout 1927 was 1,772,000, compared with 1,805,780 during 1926. This was a reduction of nearly 34,000, or somewhat less than two per cent.

The aggregate compensation paid to employees during 1927, however, was only slightly below 1926, the comparative figures being $2,980,000,000 in 1927 and $2,990,000,000 in 1926. This was a decrease of about one-third of one per cent, compared with the reduction of two per cent in number of employees.

It follows that the average compensation per employee was on a higher level in 1927 than during the previous year, just as the average annual compensation in 1926 was higher than in 1925, while that for 1925 was higher than in 1924. Progressive increases during the past four years brought the average for the year 1927 to approximately $1,682. The corresponding average for 1926 was $1,656, while that for 1925 was $1,640. In 1924 it was $1,613.

The number of hours worked showed a slight decline in 1927. The average per day in 1926 was 8.57 hours, while the corresponding average for 1927 was 8.54 hours. This indicates that the increased compensation received by the average railway employee in the year 1927 was not due to increased overtime work, or to any increase in the number of the hours of regular work per day, but was entirely the result of increased wage rates.

Had the same average compensation been received by the employees in 1927 as in 1926, the total payroll of the railways would have been approximately $50,000,000 less than it was. Bearing in mind the reduction in the average number of hours worked per day, it seems fair to conclude that increased wage rates were responsible for not less than $60,000,000 of the total wage bill of the railways in 1927, as compared with the corresponding wage rates of the previous year.

Conclusion

Although the railways suffered some disappointments during the past year, especially with regard to the amount of their freight and passenger traffic, and a corresponding decline in the levels of their gross and net earnings, and although they saw the rate of return on their property investment fall not only below the average attained in 1926, but also below that for 1925, yet they maintained throughout the year a highly satisfactory standard of railway performance.

They continued their persistent drive toward that goal of railway efficiency and economy which is not only contemplated by their obligation to supply adequate service to the American people, but is also specifically required by the terms of the Transportation Act. To maintain their high standard of operating efficiency, in the face of declining traffic and other discouraging conditions, was an even greater achievement than would have been the case had the traffic and financial results risen to new record levels.

As to the immediate future, there is a confusion of prophecy. Some voices in the financial and business world are predicting greater economic activity throughout the United States this year than in any previous year of American history. Other voices are sounding a note of caution, basing their opinion on a number of factors in the economic situation. Still other voices are definitely predicting a business recession, such as would further affect railway traffic, and would lead to continued declines in the volume of their freight and passenger service. If the last named group of prophets wish to offer a statistical basis for their prediction, they may find some support in the table of moving averages (Table II), which shows that the percentage decline in freight traffic was growing continuously greater during the last few months of 1927, and showed no indication of being checked at the turn of the year.

However this may be, one thing is certain. The railways of the United States will not remit any portion of their effort to supply the industries of the country with an underlying basis of prompt, dependable, and adequate transportation service. They will continue to improve their equipment and other facilities, and their methods of operation, so as to assure a continuation and improvement of their present character of service.

In the long run, the trend of general business, and of railway traffic and earnings, must be upward. Of that there can be little doubt, and it is one prophecy on which all economists and business observers are agreed. Whether the upturn will come at once, or later in 1928, or in some still later year, is the big question that must remain unanswered until the passing months supply the facts of record.

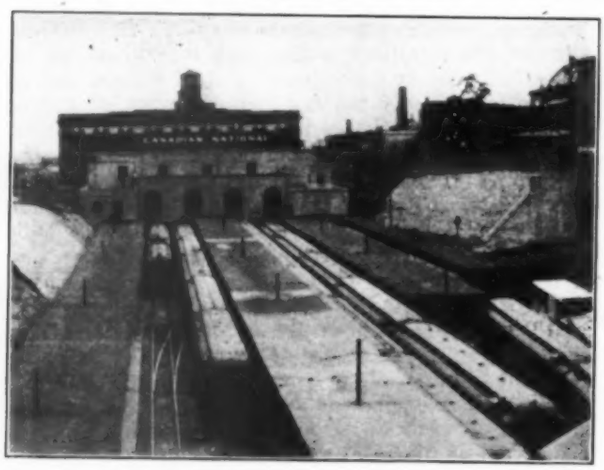
The C. P. R.'s Chateau Laurier at Quebec, from the Air

Canadian Prosperity Continues

Roads not doing quite as well as last year, however, because of rate reductions and higher wages

By James G. Lyne
Associate Editor, *Railway Age*

THE past year has not been a spectacular one for the railways of the Dominion. Net earnings of the Canadian National for the first ten months of the year were 3.8 million under those of the same



C. N. R. Tunnel, Montreal—Site of Proposed New Unified Terminal

period in 1926 and those of the Canadian Pacific were about five million less than in the 1926 period. These losses were almost entirely attributable to wage increases which have been put into effect during the intervening period, together with some declines due to adjustments in freight rates. Traffic volume held up well during the year, cumulative car loadings up to December 17, 1927, being 128,000 ahead of the same period in 1926.

Gross earnings of the Canadian National for the first ten months of 1927 totaled $219,708,431, compared with $216,711,581 for the same period in 1926. Operating expenses for the 1927 period were $186,366,833, as against $179,568,061 in the preceding year. The Canadian Pacific had an increase of $1,675,254 in gross for the ten-month period, while operating expenses at the same time increased $6,787,865.

While the change from an earnings standpoint was not spectacular, it will be remembered that 1926 was by far the best year the roads had had since the war and, even had there been no adverse developments in wages and rates, a continuation of the same proportional improvement could not have been expected to continue each year indefinitely. The past year, in other words, has been one of steady prosperity in Canada, but one in which the railroads have not been permitted to share to the fullest extent by reason of their paying more to their employees and receiving less from their patrons than in the preceding year.

Downward Rate Revisions

The wage increases have been awarded from time to time—now to this class of employees, now to that—during the past year. The important freight rate re-

ductions have been two in number: the Maritime reduction and the "equalization" decision. The reduction in rates in the Maritime provinces—20 per cent—was ordered by Parliament at its last session, carrying out one of the recommendations of a Royal commission which made an intensive study of economic conditions in that section of the country. The act decreeing this reduction also provided for reimbursing the privately owned railways for the losses entailed by this 20 per cent reduction and for the segregation of the accounts of the Canadian National Maritime lines from those of the rest of the system. Any deficiency in earnings of these lines will henceforth be met as a direct charge in the Canadian government's budget. The Maritime rate reduction, therefore, does not have a direct effect on the revenues of the Canadian railways. Its indirect effects, however, have been important.

The "Equalization" Decision

The decision having a direct bearing of railway prosperity is that made by the Board of Railway Commissioners in the so-called "equalization" case. It will be recalled that in 1924 the arbitrary Crow's Nest Pass rate agreement was revived and that many discriminations arose out of applying these rates only to those points involved in the original agreement. There followed a general investigation by the Railway Board of the entire rate structure, with the result that the low Crow's Nest basis of rates was made to apply over wide territory in the West.

The "equalization" decision brought all grain and flour rates in Alberta, Saskatchewan and Manitoba down to the Crow's Nest basis; affirmed a previous decision removing the west bound differential against west bound wheat and flour through the Rocky mountains; and virtually halved the east bound rate on export all-rail grain from the head of the lakes to Quebec City via the National Transcontinental line of the Canadian National. These reductions did not come into effect until September so their results cannot as yet be fully known.

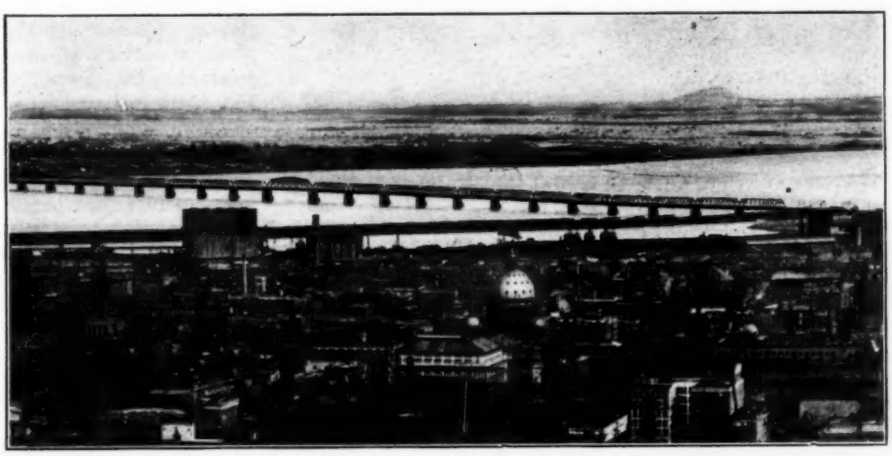
Early in the year, however, President Beatty of the Canadian Pacific issued a statement of warning pointing out the danger of wage increases combined with rate reductions and Sir Henry Thornton, president of the Canadian National, made the statement that if the Canadian rate basis were the same as that in the United States, the C. N. R. would have earned a net of $72,000,000 in 1926 instead of the actual $46,000,000, and that statement was made prior to the reductions of the "equalization" decision. The problem of securing adequate rates for the service performed is quite plainly one of the most serious which confronts the Canadian roads.

Political Agitation Follows Maritime Reduction

It has been stated above that, provision being made to reimburse the railways for the freight rate reduction in the Maritimes, there are no direct losses to them under it. The act has, however, had quite important consequences, and a first-rate Parliamentary battle seems not unlikely. The Canadian National has two important connections with the Canadian Pacific in the territory—one at St. John, N. B., and the other at Ste. Rosalie, P. Q. The question arises over the publication of through tariffs on westbound movement via these two points, using the Canadian National to them and the Canadian Pacific beyond. The Canadian National has opposed such tariffs while certain interests in the Maritimes have favored them and the tariffs were ordered by the Dominion Railway Board. An appeal to the Supreme Court of Canada has favored the Canadian National as far as St. John is concerned but has taken the opposite view with regard to Ste. Rosalie. The matter is being actively discussed at the present time and it seems that Parliament will probably be called upon at its session which opens the latter part of January to act as arbiter in the dispute.

Aside from the situation outlined above, the political side of Canadian railroad affairs has at present little to mark it. The grain-producing areas have in the main secured their more important desires in the way of rate concessions and the country as a whole is more prosperous than it has been at any time since the war. Outside of the Maritimes therefore there seems to be general satisfaction with the service.

There is tranquility also in the field of employee relations, most classes having benefited by increases in their wages during the past year.



Montreal, Showing Victoria Bridge Over the St. Lawrence, Used by the C. N. R.

As is generally recognized, an important part of the mileage of the Canadian railways—and this is particularly true of the C. N. R.—has been built for development purposes and in advance of existing traffic requirements. The future, therefore, of the railroads depends in large measure on the extent to which population and production tends to grow to absorb existing transportation facilities. Present and prospective traffic of the two leading systems were dealt with at length in the special Canadian number of the *Railway Age* (issue of June 4, 1927) and need not be dwelt upon further here than the mere statement that industrial development on a number of lines of light traffic promises to bring them into the category of earners.

Construction of New Lines

However, the construction of lines for development purposes continues. Some of them may pay from the outset, but on others early profits cannot be expected. The outstanding case of such a line is the Hudson Bay Railway. Work is proceeding on this line, with the expectation that it will be completed to Fort Churchill on Hudson Bay by the latter part of 1929. Some observers do not believe that this line will ever carry much of the sort of traffic which its promoters originally foresaw, i. e., grain. On the other hand mining developments in territory it traverses are showing a great deal of promise. The two large roads with the Hudson Bay Railway (owned by the government) and the Temiskaming & Northern Ontario (owned by the Ontario provincial government) constructed well over 300 miles of new line in 1926 and several hundred miles additional are now under construction. Both the large railways have added to their hotel facilities and further improvements are in prospect. The large union station at Toronto came into operation during the year, with grade crossing eliminations progressing. The Canadian National has made public tentative plans for a new modern terminal in Montreal, involving a unification of existing terminals and electrification for its lines entering the city.

Prince of Wales Opening New Toronto Union Station

Acquisitions of new equipment, while not exceptionally heavy, held up very well, as shown in statistical articles elsewhere in this issue, the totals being 58 for locomotives, 2,133 for freight train cars and 143 for passenger train cars. The Canadian National during the year placed in operation 8 additional rail motor car units.

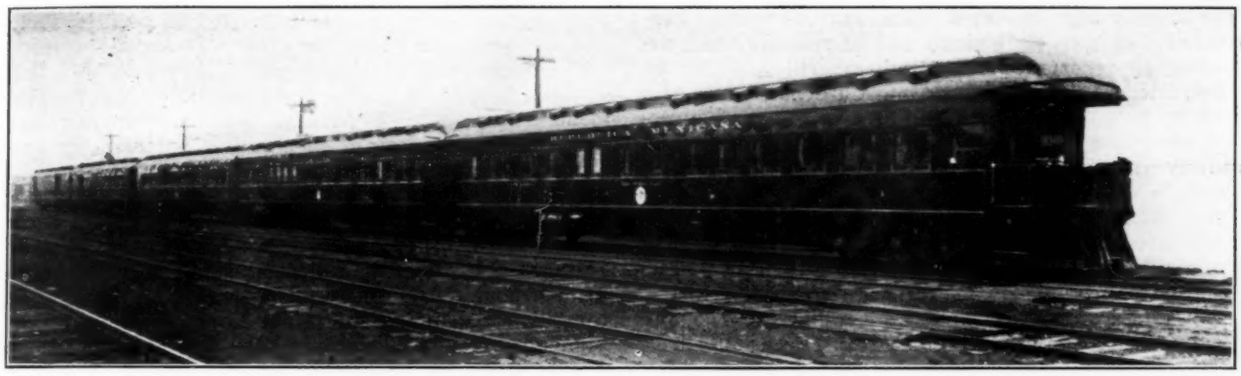
Both the Canadian National and the Canadian Pacific were affected by the heavy floods in the East in the early part of November, their lines into New England being those hardest hit. Service on the Canadian Pacific's main line between Montreal and Boston was disrupted for several weeks and the Canadian National's subsidiary, the Central Vermont, has not yet been able to restore through service into Southern New England. Indeed this latter company has, by reason of the tremendous losses caused by the flood, been forced into a receivership. Never of late years a prosperous property it was nevertheless each year showing important improvements in operating efficiency and earnings. Unfortunately, however, it was so situated geographically as to bear over a considerable proportion of its main line the full brunt of the inundation where it was at its very worst. Then, despite prompt and thoroughgoing efforts toward rehabilitation, reconstruction could not be completed until the onset of winter weather.

Conditions Fundamentally Sound

While the Canadian roads did not in 1927 have quite such a prosperous time as they did in 1926, still their situation when compared with that of only a few years ago is vastly improved. In 1921 the Canadian National had an operating deficit and since that time its net has steadily progressed until it is now over $40,000,000. Charges including those on obligations held by the government still exceed this figure by some $30,000,000 and with such a large mileage of lines built in advance of traffic demands it may be some time before earnings are great enough to pay fixed charges. The Canadian Pacific with earnings of only 4.25 per cent on its capital investment in its best post-war year, 1926, is nevertheless so conservatively capitalized that its stock is selling at over 210 on the New York Stock Exchange on a basis of 10 per cent dividends.

Canada is still a country with room for great industrial and agricultural expansion and the railroads are playing an active part in development work. Both large roads have colonization lands and both engage in a semi-official capacity with the government to encourage a desirable immigration. Their efforts are each year meeting with increasing success, with 1927 showing the largest totals yet reached.

C. P. R. Train with Open Observation Car Used in Canadian Rockies



President Calles' Private Train—Photo Underwood & Underwood

Outcome in Mexico Still in Doubt

National railways suffer losses—Study and recommendations by Sir Henry Thornton before directorate

By W. Rodney Long
Transportation Division, U. S. Department of Commerce

DURING the calendar year 1927, Mexico experienced a period of depression which severely retarded the further development of its transportation facilities and handicapped its carriers in making necessary improvements to their lines. From the very first of the year up until almost the present time, there have been labor troubles. Beginning with the railway shopmen's strike at Salina Cruz, which spread to other centers of transportation, railway operation has been severely handicapped. This, followed by the attempted revolution, resulting in sabotage, attacks on strikebreakers and railway trains, have caused disorganized train service which oftentimes resulted in the suspension of certain trains and the entire elimination of others.

Financial statistics for the operation of Mexican railways during the last year are not yet available. According to articles appearing in the local Mexican press, it is indicated that financially, the operating results of the National Railways will show a severe decline. This also may be arrived at by an examination of current events which will disclose various train services discontinued and reductions in forces, steps which presumably must have been taken from a standpoint of economy. Another event indicating that the operating conditions, particularly of the National Railways, are not satisfactory, is the invitation to Sir Henry Thornton, president of the Canadian National Railways, to go to Mexico to make a study of the National Railways. Sir Henry went to Mexico early in November with two or three of his staff officers and spent a month studying conditions. His report, which has not yet been released, is awaited with interest.

Of the privately operated railways in Mexico, the most important of which, excluding the Southern Pacific of Mexico which has just completed its through service to La Quemada, is the Mexican Railway, which, according to its annual report, earned during the six months ended June 30, 1926, a net of approximately $500,000.

On April 17, 1927, the connecting link of the Southern Pacific's line was completed and train service inaugurated. The section from Tepic to La Quemada was the last link to be constructed in the Nogales-Guadalajara-Mexico City chain.

Until this line was opened there was no direct means of communication with central Mexico from the west coast and it was necessary to go by rail to Nogales, Arizona, and from there to El Paso, Texas, and south by the National Railways of Mexico or else by water to Manzanillo and from there by rail via Guadalajara to Mexico City. The new line crosses the entire west coast district from Nogales, Ariz., to La Quemada, a distance of approximately 1,000 miles.

The district through which this line passes is supposedly rich in minerals and in addition it offers transportation facilities to practically all the Mexican west coast ports. The opening of this railway is bound to benefit the west coast exporters as the route over which it operates is the shortest and most direct to the central plateau markets where 70 per cent of the Mexican population is centered.

The only construction work carried on during the year just ended was the completion of the Tepic-La Quemada stretch of the Southern Pacific mentioned above, electrification on the Vera Cruz-Mexico City line, and the work completed on the Kansas City, Missouri & Orient between Chihuahua and Presidio, Texas. This limited construction was due to internal conditions which prevented the inauguration of other construction programs if conditions had been more satisfactory. During 1927 the Mexican Railway completed its electrification program of the 45-mile stretch between Cordoba and Esperanza, on the Vera Cruz-Mexico City line. This stretch embraces the heavy grade section of the route between Vera Cruz and Mexico City and makes the former port more valuable as a port of entry for Mexico City, because of the reduction in schedules. The Kansas City, Missouri & Orient has a section between Chihuahua and Presidio, Tex., under construction. It is expected that this line will be completed by the middle of 1928.

During the year 1928 several construction programs

have already been indicated. The Torres-Prietas (Ferrocarril Mexicano de Union) will be reconditioned, according to reports. A new railway will probably be constructed between Chiltepec and Cardenas, which will open up a new banana growing area in a favorable section along the Rio Seco. The construction of a light railway from Macuspana to Encarnacion, Tabasco, is planned. Material for this construction is already arriving from the United States. This railway is to be constructed for the purpose of transporting drilling materials to a petroleum exploration site near Encarnacion where promising seepages are known to exist.

The Mexican market for railway rolling stock, equipment and accessories during the past year should have been extremely fertile, but due to internal discord few orders were placed.

Shipments from the United States, on the other hand, for the ten months ended October 31, 1927, show an increase over the calendar year 1926. During this ten-months' period shipments were made of 25 steam locomotives, 13 industrial locomotives, 21 electric railway cars, 63 steam railway passenger cars, 194 freight cars and parts of cars and air brake equipment valued at $216,115. For the calendar year ended December 31, 1926, shipments were made of 19 steam locomotives, 21 industrial locomotives, 107 steam railway passenger cars, 195 freight cars and parts of cars and air brake equipment valued at $385,891.

During the year several officers of the National Railways of Mexico visited this country for the purpose of securing additional rolling stock and equipment. However, it is not believed that any important orders were placed and negotiations are now said to be under way with German concerns for the purchase of rolling stock. German concerns are reported to have offered the National Railways liberal credit and in addition excellent terms of payment for any material which they may purchase.

It is extremely difficult to say what next year will bring forth in the way of orders from this country, but it is known that locomotives and rolling stock must necessarily be purchased in the immediate future, if some of the lines are to continue in operation.

One of the outstanding developments affecting the interchange of freight between American and Mexican rail carriers was the inauguration of the through billing arrangement effective on May 20 concerning all-rail shipments to Mexico.

After the 1914 revolution in Mexico, shipments moving via the all-rail route to points in Mexico were consigned to the care of a customs broker at the border crossings. His duty was to take delivery at the American side of the Rio Grande and arrange for reforwarding the shipment to its final destination in Mexico.

Under the new procedure, effective April 7, 1927, this arrangement is unnecessary. Southwestern Lines Tariff No. 112-D permits the issuance of through bills of lading from all points of origin in the United States and in the Province of Ontario, Canada, and from such other points in this tariff to the Rio Grande crossings, to all points in Mexico located on the National Railways of Mexico and operated lines.

[EDITOR'S NOTE.—*Since the above article was written by Mr. Long, developments with regard to the National Railways of Mexico have taken place with dramatic swiftness and, by the time these lines appear in print, some thoroughgoing steps may have been taken toward changing the destiny of these railways. Some of these developments are outlined below:*]

A dispatch from Mexico City on December 6 to the New York Herald Tribune attempted to presage some of the conclusions which Sir Henry Thornton's investigation might reach. It is generally believed, says this dispatch, in railway circles here that the principal recommendations to be made by the Canadian expert are that there must be at least a 33 per cent reduction in personnel of the present staff and that rolling stock be used more effectively to handle traffic.

According to these figures, in 1927 there are three times as many shop employees as in the previous peak year of 1910, when the railroads were under American management. And today there are 7,000 fewer box cars in use than in 1910. The figures relative to the number of freight cars are, in 1910, 18,000, and in 1927, 11,000. There are now 125 fewer locomotives than in 1910.

The enormous increase in wages, with corresponding increases in number of workers, are assigned as factors making profitable operation of difficult matter. In the period between 1908 and 1909 there were 22,000 employees in the general offices, right of way, transportation and equipment departments. In 1926, in the same departments, there were 41,000 workers. The 1908 wages were 2,005,576 pesos (about $1,000,000) and in 1926 they were 8,155,924 pesos for general office workers alone. The right-of-way department paid in salaries, for 1908, 3,098,795 pesos; in 1926, 12,867,780 pesos. For the equipment branch in 1908, 5,980,918 pesos was expended, compared with 20,306,592 pesos in 1926. Transportation department employees in 1908 received 5,076,513 pesos, against 22,993,578 pesos in 1926.

The income for the first six months of 1926 was 55,773,089 pesos, while for the same period last year it was 56,864,761 pesos—a decline of 1,091,672 pesos. Operating expenses were 52,283,281 pesos for the six months of 1927, compared with 50,651,525 pesos for the corresponding period of 1926.

In 1914 the government took over the National Lines and operated them until 1925, when they were restored to private management. Throughout this eleven-year period of federal operation losses were registered, and since that time the roads have been losing steadily. Their estimated monthly deficit at the present time is 1,000,000 pesos.

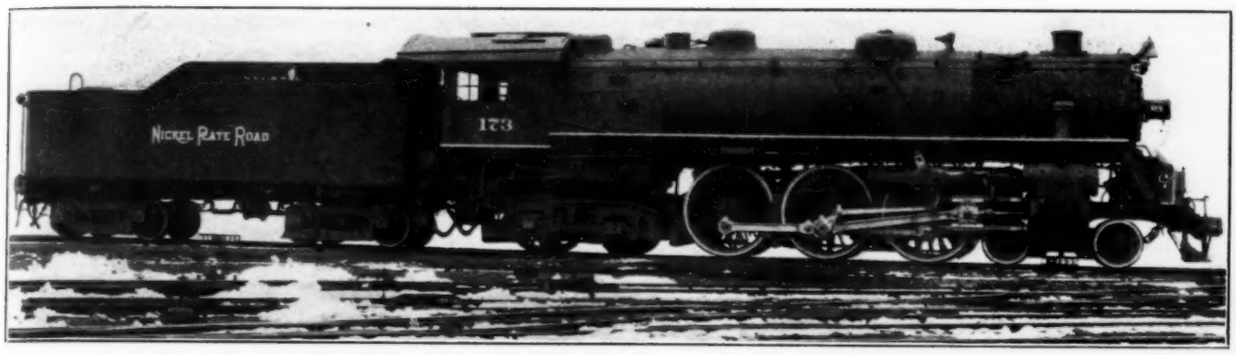
Both Traffic and Income Fall

The suffering of financial reverses is general throughout all branches of the line, according to statistics. Traffic, in addition to income, is falling off. There is not enough freight at present to make the lines pay profits. Lines pass through many sections, unopened to exploitation and progress, and naturally freight business is slight and unprofitable in these regions.

It is the general belief that many of these isolated sections will be opened, through the road building program being launched by President Calles. When this is completed, say financial experts, freight tonnage will materially gain.

Following the submission by Sir Henry Thornton of his report to President Calles, rumors were current in Mexico City to the effect that the National Railways might be taken over by a group of Canadian capitalists. No confirmation of this rumor was given, however. A dispatch from Mexico City to the New York Times on December 20 stated the belief that, in addition to the economy features of the Thornton report, there were recommendations concerning increasing traffic, the most important of which was that propaganda be instituted to stimulate tourist traffic.

Meantime the managing director of the railways, Bertram Holloway, has tendered his resignation.



An Example of the Application of the Four-wheel Trailer to a Six-coupled Locomotive—Built by the American Locomotive Company*

The Year's Trend in Equipment Development

Extension of the use of four-wheel trailer trucks—More standard freight car types being developed

By C. B. Peck
Mechanical Department Editor, *Railway Age*

IN discussing the trend of locomotive development in the last three preceding statistical numbers of the *Railway Age*, attention has been called repeatedly to the era of intensive locomotive development which has been under way practically since the close of the World War. Each year attention was called to a number of locomotives with new wheel arrangements which had appeared during the preceding twelve months. These new types have recently been characterized by the use of the four-wheel trailer and the tendency toward its more general use has been well marked during 1927. The primary object of the four-wheel trailer truck is to secure larger boiler capacity and better boiler proportions. Larger boiler capacity means more horsepower, and more horsepower means the maintenance of existing schedules with heavier trains in passenger service and the hauling of heavier trains or increases in speed, or combinations of both of these factors, in the case of freight train service.

Most of the locomotives built during the past year with four-wheel trailer trucks have been of the eight-coupled type, some with two-wheel leading engine trucks and others with four-wheel leading trucks. The tendency is markedly toward the use of the booster with the four-wheel trailing trucks, and in some cases where the boosters were not actually applied at the time the locomotives were built, provision has been made in the design of the trailer to permit their application later.

An interesting application of auxiliary power to meet special conditions has been made on two railroads during the past year. On the Norfolk & Western and the Missouri Pacific the tender trucks of one or more locomotives for use in hump yard service have both been replaced with auxiliary locomotives to permit the utilization of the maximum proportion of the combined weight of the locomotive and tender for adhesion, in service where the slow speed does not ordinarily place a heavy tax on the boiler capacity.

The recent trend toward intensive capacity development in single-unit coupled wheelbases has left little field for the compound articulated locomotive with its excessively large low pressure cylinders and high back pressure horsepower and its difficult working stresses at other than slow speeds.

The substitution of simple for the compound cylinders in the articulated wheelbase, however, has given the articulated type a new lease of life and it is performing splendid service on a number of railroads. This type of locomotive continues to receive attention where extremely large tractive force is required where grades are long and heavy or where drag traffic predominates.

Those who had the opportunity to examine the King George V of the Great Western Railway of England, while it was on exhibit at the Baltimore & Ohio Centenary and Pagaent last October, will probably agree that the outstanding structural difference between British and American locomotive practice is the great extent to which in this country we have replaced fabricated parts with unit steel castings. The tendency toward the replacement of built-up structures in our equipment with single steel castings, some of them extremely large and of complicated form, has been going on so long in this country that it has ceased to attract much attention. Our tender frames, including the bottoms of the water tanks, are now frequently produced as single castings. In electric locomotive construction it has become well established practice to replace the built-up frame system with a single bed casting, and this idea has also been applied to a limited extent in the steam locomotive. What gives the matter particular interest in a review at this time is the design of a complete locomotive smokebox in the form of a single casting which was brought out during the past

*This locomotive carries 210 lb. pressure; has drivers 73 in. in diameter, and cylinders 25 in. by 26 in.; carries 175,500 lb. on drivers and 316,500 lb. total engine weight; has 4,219 sq. ft. evaporating surface, 1,103 sq. ft. superheating surface and 66.8 sq. ft. grate area, and develops a tractive force of 39,700 lb.

year. The casting of cylinders in steel has now become well established practice and the cylinders, the frames, frame braces and crossties have already, in at least one instance, been combined into a single cylinder and bed casting. The next step worthy of the daring and enterprise of the designer and foundryman will be the merging of the smokebox into this unit casting.

Freight Cars

Any discussion of the tendencies in freight car design and construction must deal largely with the progress of the standardization program which the American Railway Association, Mechanical Division, now has under way. To the single and double wood sheathed box cars, which are now standards of the association, the past year has seen the addition of the general design of a standard stock car built up on the single sheathed box car frame. The details of the design of this car are now

A 70-Ton Hopper Car, Built at the Cambria Plant of the Bethlehem Steel Company—This Car Embodies the Essential Features of the Proposed A.R.A. Standard Design

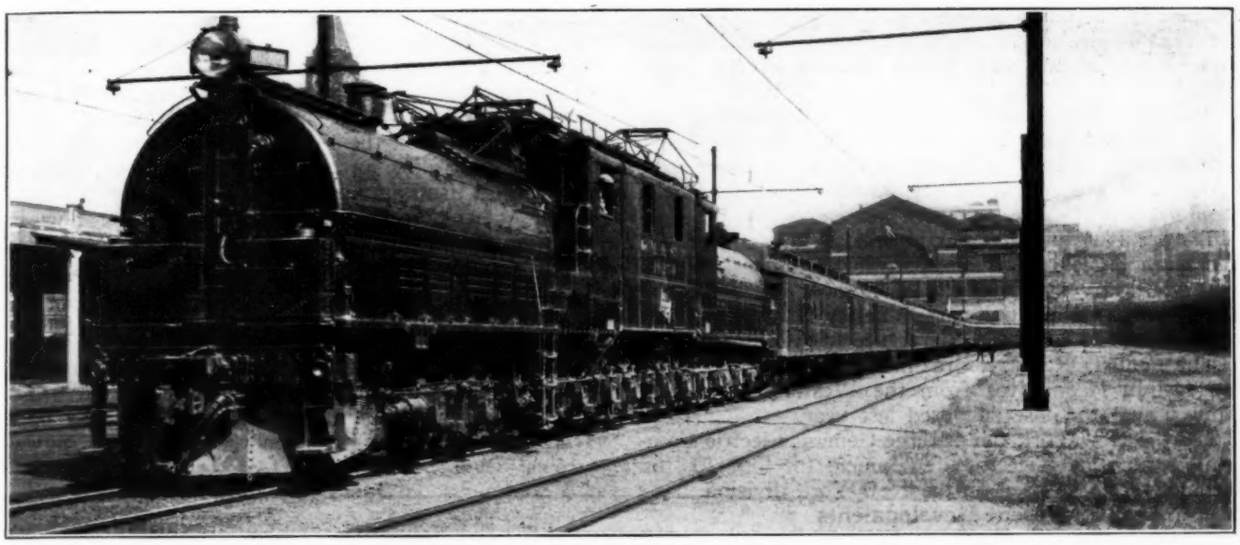
being worked out by the Car Construction Committee. This committee also has under way the development of the general design for standard automobile cars and for 50 and 70-ton self-clearing hopper cars. General designs of the two latter cars have already been presented to the association, but the completion of the design since the final adoption of the height at 10 ft. 8 in. has not yet been effected. The essential features of the design, however, have already been incorporatd in new cars on a number of railroads, and one of these cars is illustrated in this article. The Car Construction Committee also has under consideration the development of a steel frame refrigerator car design to be built up around the A.R.A. box car underframe and to use trucks of standard A.R.A. design.

The one feature of freight car equipment in which the tendency now seems to be away from standardization is truck design. The service of standard designs, with the difficulty which they offer in securing sufficient spring capacity for the higher capacity cars, has placed the matter of truck design very much in a state of flux. The Car Construction Committee is working with the spring manufacturers to bring about the development of springs possessing qualities sufficiently superior to those of the present standard type, so that satisfactory service may be insured in trucks with the present standard type of bolster opening. In the meantime, several types of trucks have been brought out and others are in the process of development, in the design of which present standards have been departed from in order that designs basically more in keeping with the present service requirements may be produced. Notable among the designs already in existence are the Dalman truck and the Symington "double truss" side frame design, the latter of which has only reached a state of commercial development during the past year.

The advantages of standardization of equipment which circulates as universally as do freight cars, are well understood and need no restatement here. It is more likely to be forgotten, however, that standardization also implies the end of development, the completion of progress. If one may borrow an analogy from the living organisms of biology and apply it to the living organism of transportation, then the end of development, the completion of progress, is one of the signs of death. The future health of the railroad transportation organism depends upon the ability to maintain a nice balance between the best of the past crystallized in standard forms, and the new forms which the present has to offer. The A.R.A. is a voluntary organization and none of its standards are sacred; each will survive or be replaced on its own merits, which in itself is sufficient assurance that all legitimate outlets for future progress are safeguarded.

Passenger Cars

No change of major importance in the trend of passenger car design or construction has developed during the past year. There has been evident, however, a continuation of the tendency, thoroughly established for some years, toward special interior arrangements of club and lounging car facilities for use on long distance trains. This has also been accompanied by marked individuality in the treatment of interior decorations, hangings and furnishings. In recently built dining cars close attention to the arrangement of the kitchen and serving facilities has led to a number of unique arrangements. Such modern items as electric refrigerating equipment and mechanical dish washers are also beginning to find their place in the dining car kitchen.



An Electric Locomotive and Train on the C. M. & St. Paul at Seattle, Wash.

Electric Traction Development During 1927

Summary of the high points marking the year's progress in electric motive power applications

By Alfred G. Oehler
Electrical Department Editor, *Railway Age*

A CHART issued in October, 1927, by the American Electric Railway Association shows that electrified mileage and electric locomotive tonnage on steam roads in the United States and Canada increased more during 1925 and 1926 than in any year previous since 1917. There is nothing spectacular about the rate of development shown, but it is apparently a healthy growth. The activities of 1927 have not quite equalled the records of 1925 and 1926, but will make a substantial addition to the total. New contracts let recently will increase activities in this field during 1928.

The most recently announced electrification project is that of the Reading Company. It has announced a $20,000,000 program including about 60 miles of line in the Philadelphia district. Just previous to this announcement came another to the effect that the narrow-gage Boston, Revere Beach & Lynn, recently purchased by Hemphill & Wells of New York City, would be electrified. Work is proceeding rapidly on the extensive program of the Pennsylvania in the Philadelphia district which will involve a new passenger terminal. An electric power contract was signed by the Pennsylvania Railroad and the Philadelphia Electric Company, which covers a minimum term of 20 years and provides not only for the power used on the present electrified districts between Philadelphia and Paoli, and Philadelphia, Germantown and Chestnut Hill, but also for the electrification now under way between Philadelphia, Pa., and Wilmington, Del., and Philadelphia and West Chester, as well as future extensions which may be decided upon later.

The New York Central is working on the electrification of its west side yards in New York City. An overhead trolley will be used north of 60th street and below this point self-propelled oil-electric and storage battery motive power units will be used.

Electric operation on the Great Northern between Cascade tunnel and Skykomish, Wash., is to be extended through the tunnel to Wenatchee, Wash., before the end of 1928. A second frequency changer substation at Wenatchee is now under construction.

The Chicago, Milwaukee & St. Paul completed the electrification of its entrance into Seattle, Wash., during 1927—a 10-mile double track line from Black River Junction, Wash.

The Mexican Railway Company has completed its second extension and is now operating electrically between Esperanza and Pasa del Macho, a distance of 62 miles.

Cars and Locomotives

Two type 1—C+C—1 and two type 1—D—1+1—D—1 locomotives were ordered during the year by the Great Northern, the former from the General Electric Company and the latter from the Westinghouse Electric & Manufacturing Company. The latter will probably be operated as four separate units. All are motor-generator locomotives and will be delivered in 1928.

Fifteen road freight locomotives and one switcher were ordered by and delivered to the Long Island during the year. The electric parts of the road locomotives were built by the Westinghouse Company and the mechanical parts were built in the railroad shops. The

switcher is a Baldwin-Westinghouse product. These are 11,000-volt, single phase, a.c., locomotives and are to be used on the Bay Ridge division of the Long Island.

The New Haven ordered and is now receiving five more 178-ton, type 1—C—1+1—C—1 Westinghouse locomotives. These have single phase commutating motors and are practically duplicates of others of the same class previously placed in service.

The Pennsylvania has put in service four more L—5 Westinghouse equipped locomotives having a 1—C+C—1 wheel arrangement and a number of additional 11,000 volt, multiple-unit cars. Thirty of these are now being equipped by the General Electric Company.

The Paulista Railway, Brazil, ordered four more 115-ton freight locomotives from the Westinghouse Company similar to those delivered last year.

For the New York Central, the General Electric Company is furnishing electrical equipment for four 200-ton locomotives to be used on the New York division.

Recent Developments

For freight service on the west side lines in New York City, the New York Central has placed in service an oil-electric, storage battery locomotive. This is a 120-ton locomotive equipped with a storage battery and a 300-hp., oil-engine generating set. The oil engine provides sufficient power for ordinary service and the battery supplies power for heavy loads of short duration. When the full power of the oil engine is not required for operation of the locomotive, it supplies charge to the battery. For operation in warehouses the engine can be shut down and the locomotive operated from the battery alone. The locomotive can also be operated from an overhead trolley.

Another interesting development is that of high-speed, air circuit breakers for alternating current circuits similar to those used for direct current. The new breakers, supplied with multiple unit cars for the Wilmington division of the Pennsylvania, have a normal rating of 1,500 amperes and will be used on 11,000 volt, 25-cycle circuits. Oil circuit breakers involving the same operating principle are also to be used.

A balanced link drive is now in passenger service on a New Haven 1—C—1+1—C—1, 178-ton passenger locomotive and it is hoped that it will duplicate the performance of the same drive used on a high-speed freight locomotive.

A 45-mile extension of the Paulista Railway in Brazil is being equipped with overhead consisting of inclined catenary with double contact wires.

Three-voltage, three-speed locomotives, with temperature control, were built for the Sacramento Northern Railway. They will operate from 1,500, 1,200 or 600 volts, with pantagraph, wheel trolley, or third rail shoe. The control provides three speeds. Indicators in the cab constantly show the motor temperature; should this exceed a safe limit, contact-making thermometers buried in the motors cut off the power. The change-over from third rail to trolley, or from one voltage to another, takes care of itself automatically.

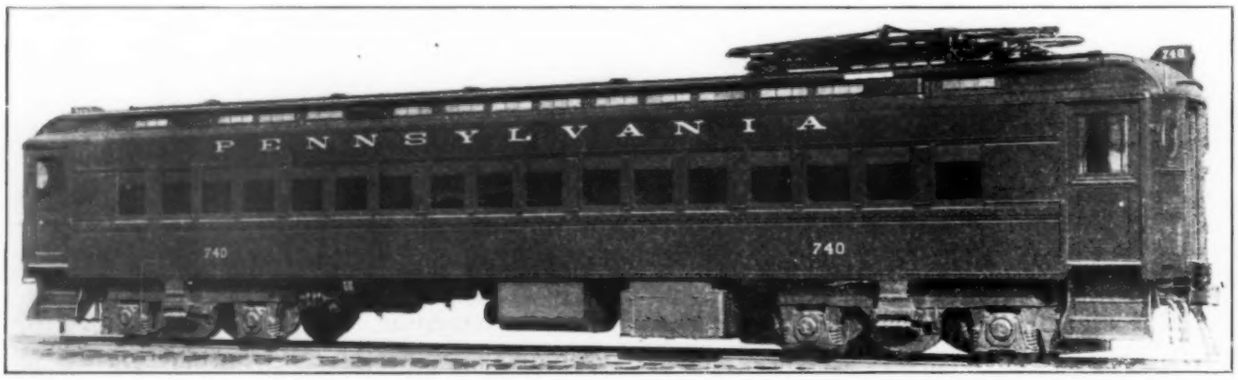
Four variable ratio frequency changers are now in operation at various points on the New York, New Haven & Hartford's traction power supply system. These machines allow for a transfer of power between the New Haven power system and the systems of the Connecticut Company, the Connecticut Light & Power Company and the Long Island Railroad. The unusual feature of these machines is that power can be transferred in either direction even though there may be a varying difference of frequency in the two power systems.

Operating Data

A most comprehensive compilation of data concerning operation of electrified lines, was included in the report of the committee on electric rolling stock presented in June, 1927, before the Mechanical Division of the American Railway Association. It dealt with electric operation on the New Haven, the Virginian, the Detroit & Ironton and the Illinois Central. A recent Illinois Central report shows that electric operation has turned a deficit into a profit. A similar change might have been effected by improved steam operation, but it is interesting to note that the profit was made possible by an increase in traffic and to note the rapid rate at which traffic increased after electric operation was installed. Mercury arc rectifiers used in the substations which supply power for the Illinois Central suburban lines have been giving a good account of themselves.

It is to be expected that motor-generator locomotives would satisfactorily perform the work expected of them on the Great Northern and they are apparently finding favor on the New Haven and the Detroit & Ironton, where there are no heavy grades to contend with.

Electric locomotives operating through the St. Claire tunnel on the Canadian National were, during 19 years, available for service 97.7 per cent of the time. This information was given out in April, 1927, by Walter D. Hall superintendent, St. Claire Tunnel. Service records of the New Haven show that out of 41 electric passenger locomotives which have been in service 20 years, the average for each serviceable locomotive is 170 miles a day and the total mileage per locomotive has reached about 1,250,000 miles. Passenger locomotives average 250 miles a day, though the longest run is only 73 miles.



A Pennsylvania Multiple-Unit Car Equipped with Roller Bearings

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Year Witnessed Large Extension of Communication Facilities, page 107

Construction Activity Continues

Drilling in Cascade Tunnel of Great Northern in Washington

Heavy expenditures made for additions and betterments—Large mileage of new lines under way

By F. M. Patterson
Associate Editor, *Railway Age*

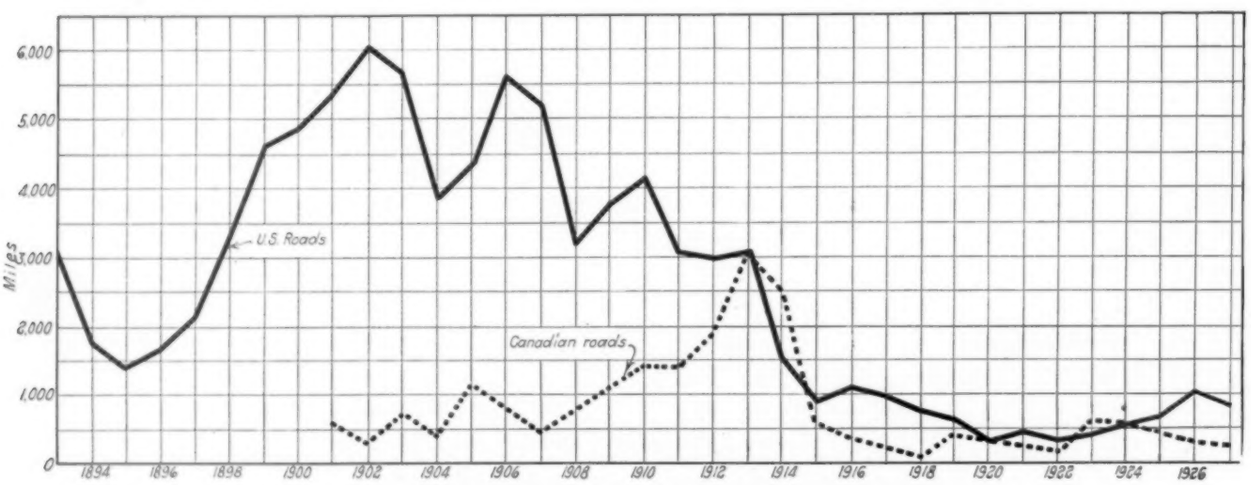
THE mileage of new lines and also of multiple main tracks built in the United States in 1927 was smaller than in the preceding year, although the year was characterized by great activity in construction and by heavy expenditures for additions and betterments to roadway and structures. The new lines completed totaled 779 miles, and the new second track aggregated 446 miles; as compared with 1,005 miles and 473 miles, respectively, in 1926. Approximately 900 miles of new lines were under construction at the end of the year, assuring a continuance of construction activities in 1928. The same factors which tended to curtail the construction of second track in 1926, namely, the completion of several major projects and the more intensive use of facilities made possible by heavier power and extensive installations of signaling, interlocking and remote control of passing track and outlying switches, again operated to keep the construction of other than second multiple main tracks at a comparatively small mileage.

These statistics are borne out by figures compiled by the Bureau of Railway Economics, which show additional tracks for the first nine months of 1927 amounted to $108,002,000 as compared with $124,084,000 during the same period in 1926.

New Routes Completed

Among the lines constructed during the past year are several which are important additions to the country's transportation facilities. One of these is the 63-mile double track line of the Chesapeake & Ohio between Gregg, Ohio, and Valley Crossing, which was built to give that company its own line for its heavy coal tonnage for northern and western markets. This line, which has a grade of 0.2 per cent against northbound traffic and 0.4 per cent against southbound traffic, was characterized by unusual speed in construction, work having been started on November 25, 1926, and the line turned over for operation on September 16, 1927.

The completion by the Gulf, Mobile & Northern, of



New Line Mileage Constructed in the United States and Canada

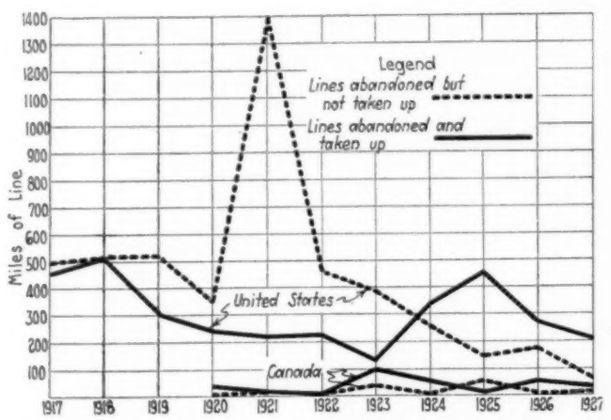
a 40-mile extension from Lena, Miss., to Pearl river near Jackson, Miss., together with the building of 6.7 miles to a connection with this line by the New Orleans Great Northern, forms a new through route from the north to New Orleans, La., via the Metropolis, Ill., gateway at the Ohio river. The low grade double track freight line of the Pennsylvania, between Canton, Ohio, and Bayard, 14 miles, was completed and placed in service in 1927.

The St. Louis-San Francisco completed 57 miles (from East Aberdeen, Miss., to Aliceville, Ala.), of its 151-mile line to connect the parent system with its subsidiary, the Muscle Shoals, Birmingham & Pensacola, and thus provide a new through route to the port of Pensacola, Fla., on the Gulf of Mexico.

The Great Northern completed 47 miles of line southerly from Bend, Ore., as a part of its extension to Klamath Falls. The Oregon, California & Eastern has started construction of 159 miles of its projected lines in eastern Oregon, but other work has been deferred pending the final decision as to certain agreements between the Southern Pacific and the Great Northern concerning the use of the projected lines. The Chicago, Rock Island & Pacific extended a line 20 miles from Fritch, Tex., to Stinnett, as a portion of a new main line from Amarillo, Tex., to Liberal, Kans.

Miles of New Line Completed in the United States Since 1893

1893	3,024	1911	3,066
1894	1,760	1912	2,997
1895	1,420	1913	3,071
1896	1,692	1914	1,532
1897	2,109	1915	933
1898	3,265	1916	1,098
1899	4,569	1917	979
1900	4,894	1918	721
1901	5,368	1919	686
1902	6,026	1920	314
1903	5,652	1921	475
1904	3,832	1922	324
1905	4,388	1923	427
1906	5,623	1924	579
1907	5,212	1925	644
1908	3,214	1926	1,005
1909	3,748	1927	779
1910	4,122		



Miles of Line Abandoned in the United States and Canada

Florida Leads in New Mileage

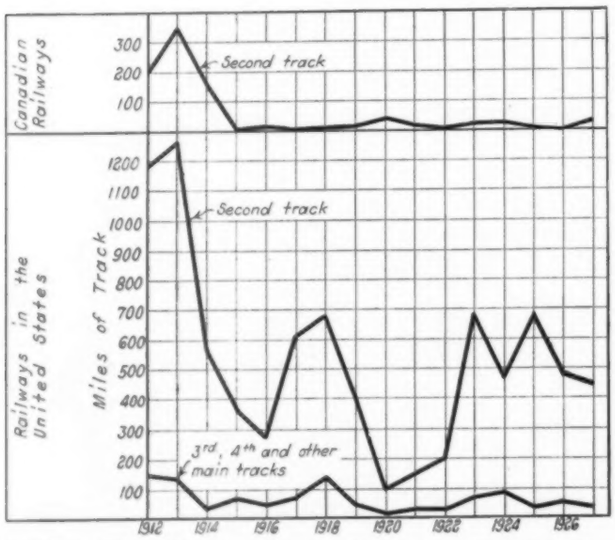
Florida ranks first among the states in the construction of new lines in 1927, with a total of 124 miles, although this contrasts with 233 miles built in that state in 1926, the decrease being due to the completion of a large part of the programs of the Atlantic Coast Line and the Seaboard Air Line during the former year. The Seaboard Air Line completed its line from Miami to Homestead, 30 miles, during 1927, as well as a line from Fort Myers to La Belle, 31 miles, besides a short line from Punta Rassa Junction to Punta Rassa, nine miles. The Atlantic Coast Line completed its new route from the north to Tampa and in addition built a line from Naples to Collier City, 16 miles. It also completed

Lines Abandoned in the United States and Canada

	Lines abandoned and taken up Miles	Lines abandoned but not taken up Miles
United States		
Atchison, Topeka & Santa Fe		
Perris, Cal., to Elsinore Junction	....	11.57
Black Mountain		
Burnsville, N. C., to Murchison	10.04	....
Chesapeake & Ohio		
Connection with Norfolk & Western, near Waverly, Ohio	0.60	....
Mineral, Va., to Arminius	....	1.59
Chicago & North Western		
White Lake, Wis., to end of line	1.33	....
Chicago, Burlington & Quincy		
Galena Junction, S. D., to Galena	....	7.00
Chalco, Neb., westerly	7.05	....
Chicago, Rock Island & Pacific		
Reasnor, Iowa, to Monroe	....	6.66
Detroit & Mackinac		
Au Sable River Junction, Mich., to Comins	49.65	....
Hardy, Mich., to Beevers	10.29	....
Eagles Mere		
Sonesby, Pa., to Eagles Mere Park	....	9.50
Kinder & Northwestern		
Kinder, La., to Emad	2.00	....
Long Island		
At Manhattan Beach	0.14	....
Louisville & Nashville		
Udora, Ala., to Erskine	0.52	....
Dunn, Ala., to Walmore	0.72	....
Near Helena, Ala., to Acton	....	5.94
Mineral Springs, Ala., to Rilma	....	2.30
Missouri Pacific		
At Herrin, Ill.	2.05	....
Carterville, Ill., to Hafer	1.45	....
New Orleans Great Northern		
Nogan Junction, Miss., to Nogan	0.25	....
New York Central		
(Cleveland, Cincinnati, Chicago & St. Louis)		
Durbin, Ohio, to Donnellville	1.49	....
New York, New Haven & Hartford		
Tanners, N. Y., to Ancram Lead Mines	3.38	....
Norfolk & Western		
Connection with Atlantic Coast Line, Seacost, Va.	0.19	....
Northern Pacific		
Iron River, Wis., to Coda	9.18	....
Markham, Wash., to Bay City	4.78	....
Pearl River Valley		
Anderson Junction, Miss., to Anderson	0.62	....
Pennsylvania		
Vincentown, N. J., to near South Pemberton road	....	2.42
Tipton R. R., Tipton, Pa.	3.61	....
Lantzy Branch, Spangler, Pa.	0.55	....
At Kennerdell, Pa.	1.80	....
At Lincolnville, Pa.	1.24	....
At Cairnbrook, Pa.	0.33	....
Morrison, Pa., to Gates	....	8.09
Tyronville, Pa., to near Lincolnville	....	6.08
Near Johnsonburg, Pa., to Clermont	....	18.40
Kramore Junction, Ohio, to West Lebanon	9.42	....
Old line, Delaware, Ohio	8.00	....
Round Lake Junction, Mich., to Jennings	3.07	....
Pigeon River		
Sunburst, N. C., to Spruce	3.08	....
Reading		
Buck Mountain, Pa., to Oak Hollow Colliery	0.44	....
At Port Clinton, Pa.	0.16	....
Norristown, Pa., to Bridgeport	0.16	....
St. Louis-San Francisco		
(Kansas City, Ft. Scott & Memphis)		
Linton, Kan., to Rich Hill, Mo.	20.78	....
(Brownwood North & South)		
Brownwood, Tex., to May	17.65	....
Seaboard Air Line		
Portion of Juneau Spur, south of Pembroke, Fla.	0.28	....
Dock Spur, Palmetto, Fla.	0.45	....
Buda, Fla., to Norwills	9.84	....
Ekal, Fla., to Sumterville	2.24	....
Union Pacific		
(Los Angeles & Salt Lake)		
Topliff, Utah, to Boulter	13.32	....
Ventura County		
At Oxnard, Cal.	0.27	....
	202.42	79.55
Canada		
Algoma Central & Hudson Bay		
Magpie Junction to Magpie Mine	9.30	....
Canadian National		
Limoges, Ont., to Clarence Creek	10.56	....
Millbrook Junction, Ont., to Omeemee	....	15.64
Great Northern		
(Crows Nest Southern)		
Elko, B. C., to Fernie	19.47	....
	39.33	15.64

five miles of a line under construction from Imokalee to Deep Lake.

Mississippi takes second place in the construction of new lines with a total of 105 miles, the Meridian & Bigbee River, having completed 20 miles in that state as a



Multiple Track Mileage Constructed in the United States and Canada

portion of its line constructed during the year from Meridian to Cromwell, Ala., 30 miles, and which is to be extended 20 miles to Myrtlewood, Ala. Texas, which was in first place in 1926, is third in 1927, with 93 miles of which the Southern Pacific built 38 and the Missouri Pacific 18 miles near the Mexican border south of San Antonio. The 20 miles built by the Rock Island has been mentioned and the Atchison, Topeka & Santa Fe built a 10-mile branch in the Panhandle.

Large Mileage Under Construction

A large mileage of new lines was under construction at the end of the year. Among the major items in this category, aside from the new line of the Frisco, which has been referred to, is included the low grade line of the Illinois Central from Edgewood, Ill., to Fulton, Ky., of which that portion from the Ohio river to Fulton, Ky., 42 miles, was placed in service during 1927, while work on the remaining portion in Illinois is well advanced. The Fort Worth & Denver South Plains, a subsidiary of the Colorado & Southern, which in turn is controlled by the Chicago, Burlington & Quincy, has pushed the work on the construction of its lines in the Panhandle of Texas, totaling 202 miles, with the probability that they will be completed early in 1928. The construction of 30 miles of line in the same general territory by the Quanah, Acme & Pacific, which is controlled by the St. Louis-San Francisco, is 75 per cent completed. The Northern Pacific has 87 miles of branches under construction in Montana, while the lines of the Oregon, California & Eastern in eastern Oregon have been mentioned heretofore.

New Lines in Canada

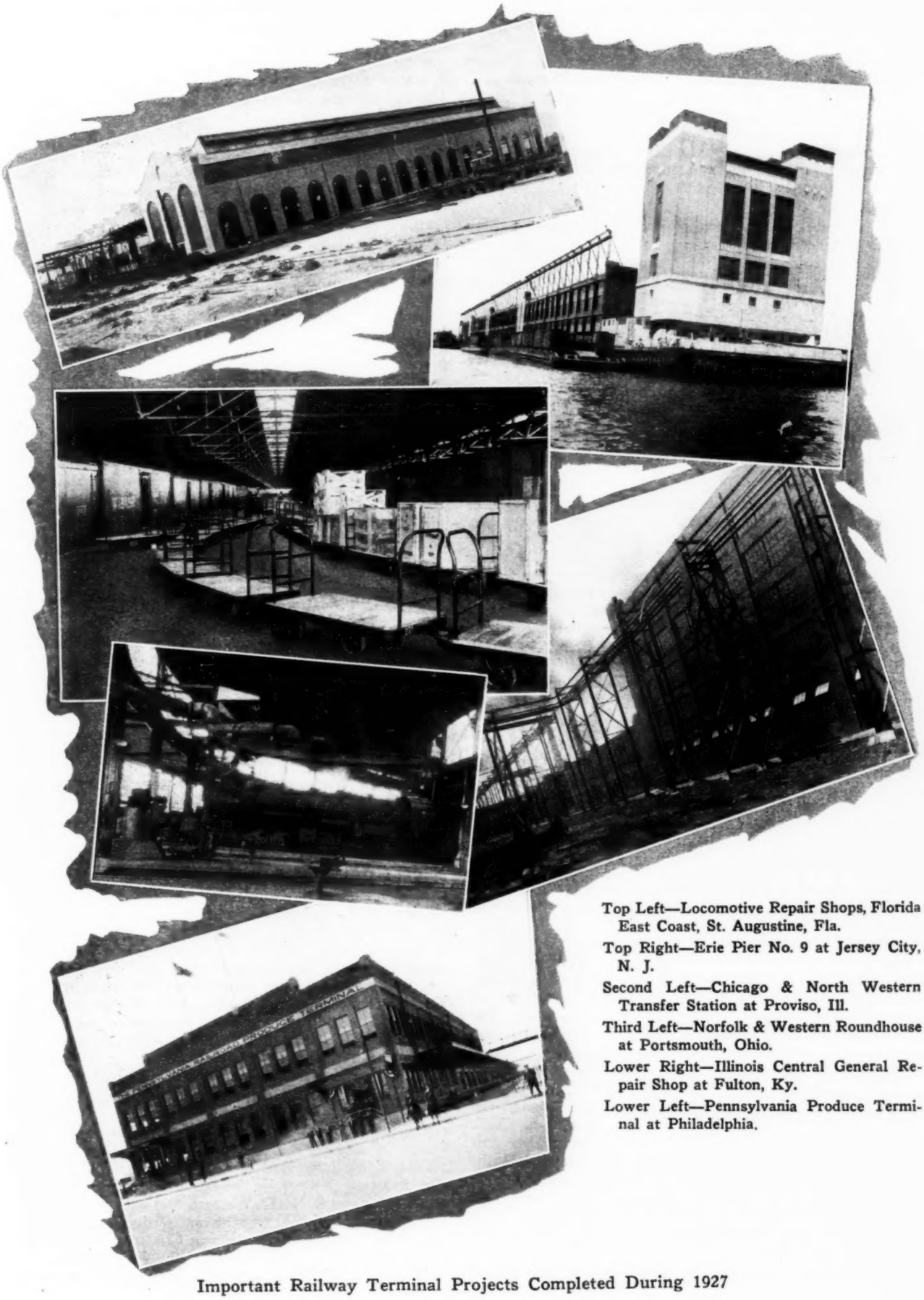
Construction of new lines in Canada, totaling 310 miles, showed a decrease of 30 miles as compared with 1926. As in the preceding year, the greater portion of this mileage consisted of branches or extensions of branches in the western provinces of Saskatchewan and Alberta, although some comparatively short lines and extensions were built to reach mining districts in Quebec and Ontario. The early completion of the Hudson Bay Railway was assured by the decision of the government to establish the northern terminal at Fort Churchill instead of at Port Nelson, as was originally planned, and the awarding of contracts for the 154-mile extension from the present end of the track to Fort Churchill. The work will be done under the supervision of the Canadian National as agent for the government, this road having acted in the same capacity in the rehabilitation of the existing line of the Hudson

New Track Built in 1926

United States	Number companies building	Miles: First track	Second track	Third track	Fourth or more track	Total
Arizona	1	145.69	24.44	....	....	170.13
Arkansas	1	.06	5.00	....	....	5.06
California	1	25.29	5.72	....	....	31.01
Colorado	2	16.35	....	....	....	16.35
Connecticut	1	0.38	....	....	....	.38
Florida	3	232.77	222.40	.91	....	456.08
Georgia	1	....	1.75	....	....	1.75
Idaho	1	21.08	....	....	....	21.08
Illinois	4	6.51	6.06	....	....	12.57
Indiana	1	0.27	.80	....	....	1.07
Kansas	1	0.18	5.38	1.68	3.40	10.64
Kentucky	3	20.75	25.96	....	....	46.71
Louisiana	3	16.66	....	....	....	16.66
Massachusetts	1	0.11	....	.20	.22	.53
Michigan	2	9.87	.74	....	....	10.61
Minnesota	2	15.67	....	....	....	15.67
Mississippi	1	14.70	....	....	....	14.70
Missouri	2	2.90	21.28	....	....	24.18
Montana	1	28.85	....	....	....	28.85
Nebraska	1	11.85	....	....	....	11.85
Nevada	1	72.10	....	....	....	72.10
New Jersey	1	....	....	.29	1.38	1.67
New York	3	....	3.95	12.42	3.92	20.29
North Carolina	1	....	4.50	....	....	4.50
Ohio	6	....	101.18	8.27	8.31	117.76
Oklahoma	3	55.46	....	....	....	55.46
Oregon	1	35.92	....	....	....	35.92
Pennsylvania	4	.27	6.12	5.35	3.03	14.77
South Carolina	1	....	2.50	....	....	2.50
Texas	5	242.23	....	....	....	242.23
Utah	1	6.28	25.80	....	....	32.08
Virginia	2	0.83	0.01	....	....	.84
Washington	1	7.50	....	....	....	7.50
West Virginia	3	1.60	8.94	....	....	10.54
Wyoming	1	12.59	....	....	....	12.59
Total	67	1,004.72	472.53	29.12	20.26	1,526.63
Canada	..	334.90	....	....	....	334.90
Mexico	..	27.50	....	....	....	27.50

New Track Built in 1927

United States	Number companies building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	2	28.85	....	....	....	28.85
Arizona	1	....	23.66	....	....	23.66
Arkansas	2	10.07	18.22	0.48	....	28.77
California	3	23.01	9.72	....	....	32.73
Colorado	1	47.25	....	....	....	47.25
Connecticut	1	0.55	....	....	....	0.55
Florida	3	124.48	6.30	....	....	130.78
Idaho	1	30.14	....	....	....	30.14
Illinois	1	....	36.09	....	....	36.09
Indiana	3	0.18	5.80	....	....	5.98
Kansas	3	8.56	22.76	4.05	....	35.37
Kentucky	3	44.04	26.78	....	....	70.82
Massachusetts	1	....	....	3.54	....	3.54
Maine	1	0.11	....	....	....	0.11
Maryland	1	....	11.50	....	....	11.50
Michigan	4	....	22.15	....	....	22.15
Minnesota	2	38.00	....	....	....	38.00
Mississippi	4	105.13	....	....	....	105.13
Missouri	1	....	20.01	....	....	20.01
Nebraska	1	6.03	0.45	....	....	6.48
New Jersey	3	1.10	....	9.23	8.27	18.60
New Mexico	2	0.43	13.95	....	....	14.38
New York	3	3.49	11.39	....	....	14.88
Ohio	4	78.36	104.83	....	....	183.19
Oklahoma	3	57.02	....	....	....	57.02
Oregon	1	47.25	....	....	....	47.25
Pennsylvania	3	2.82	5.48	....	1.47	9.77
South Dakota	1	15.87	....	....	....	15.87
Tennessee	1	....	2.86	....	....	2.86
Texas	5	93.18	74.43	....	....	167.61
Washington	1	6.50	....	....	....	6.50
West Virginia	3	6.34	4.70	0.61	0.75	12.40
Wisconsin	1	....	25.00	....	....	25.00
Total	70	778.76	446.08	17.91	10.49	1,253.24
Canada						
Quebec	2	53.60	....	....	....	53.60
Ontario	1	14.00	....	....	....	14.00
Manitoba	2	24.00	31.60	....	....	55.60
Saskatchewan	2	81.20	....	....	....	81.20
Alberta	3	136.87	....	....	....	136.87
Total	10	309.67	31.60	....	....	341.27
Mexico	2	28.85	10.05	....	....	38.90



Top Left—Locomotive Repair Shops, Florida East Coast, St. Augustine, Fla.

Top Right—Erie Pier No. 9 at Jersey City, N. J.

Second Left—Chicago & North Western Transfer Station at Proviso, Ill.

Third Left—Norfolk & Western Roundhouse at Portsmouth, Ohio.

Lower Right—Illinois Central General Repair Shop at Fulton, Ky.

Lower Left—Pennsylvania Produce Terminal at Philadelphia.

Important Railway Terminal Projects Completed During 1927

Bay Railway from The Pas, Man., to Mile 332, and the 24-mile extension to Mile 356, which was completed in 1927. In addition, the government has awarded a contract for the construction of a branch from The Pas to the Flin Flon mining district in northern Manitoba, 85 miles. The only second track constructed in Canada during the year was a 32-mile section on the Molson cut-off of the Canadian Pacific between Molson, Man., and Winnipeg. At the end of 1927 a total of 640 miles of new lines were under construction or contract, of which 239 miles were in Manitoba and 317 in Saskatchewan.

The Southern Pacific of Mexico, by building four miles of line in the mountains of Jalisco, completed its main line from the United States border at Nogales, Son., to a connection with the National Railways of Mexico at Orendain, Jal., a distance of 1,079 miles. Through trackage over the National Railways, the Southern Pacific of Mexico operates its trains to Guadalajara, the capital of Jalisco, where it has constructed a yard and other terminal facilities. The only other construction of any consequence in Mexico during the year was the completion of the electrification of 18.7 miles of the Mexican Railway between Cordoba, V. C., and Paso del Macho, as a part of its program for electrifying its mountain section, where the grades range from 3.5 to 4.7 per cent.

The mileage of new lines constructed in Mexico was slightly larger than in 1926, the total of 29 miles in 1927 comparing with 27.5 miles in the preceding year. The National Railways of Mexico completed 26 miles of the projected short line between Mexico and Tampico, and in addition spent large sums on the installation of timber treating plants and facilities, at Acambaro, Gto., and Durango, Dgo. Construction also began on an extensive repair shop and engine terminal project at Monterrey, N. L. This system completed 10 miles of second track in the states of Chihuahua and San Luis Potosi.

New Second Track Mileage

The greater portion of the second track completed last year was built by a few of the larger roads, the longest consecutive mileage having been placed in service between Pampa, Tex., and Canyon, 73.5 miles, on the Panhandle & Santa Fe, a subsidiary of the Atchison, Topeka & Santa Fe, to handle the heavy oil traffic on that line. The Santa Fe also built a continuous stretch of 37 miles of second track between Defiance, N. Mex., and Chambers, Ariz., on its main line to the Pacific Coast. The Chesapeake & Ohio built 57 miles of second track in connection with the construction of its line between Gregg, Ohio, and Valley Crossing. The Pennsylvania built 36 miles on its St. Louis division in Illinois, and 14 miles in connection with the constructon of its new line between Canton, Ohio, and Bayard. The Missouri Pacific built 20 miles at various critical points on its main line between St. Louis, Mo., and Jefferson City, as well as 10 miles on its main line in Arkansas, while the Louisville & Nashville, by constructing 13 miles between Conway, Ky., and Sinks, completed the double tracking of its line between Cincinnati, Ohio, and the Harlan, Ky., coal fields. This road also built 14 miles between Lebanon Junction, Ky., and Elizabethtown on its main line from Louisville, Ky., to New Orleans, La. The Chicago, Burlington & Quincy built 25 miles in Wisconsin as a part of its program of double tracking its line from Savanna, Ill., to St. Paul, a distance of approximately 290 miles.

Satisfactory progress was made on the new tunnel of the Great Northern through the Cascade mountains in Washington, several previous records in tunnel driving having been exceeded during the year. The work was 65 per cent completed at the end of the year and it is expected that it will be finished in November, 1928. The enlargement to full section of the Moffatt tunnel in Colorado is nearly completed and this will enable the Denver & Salt Lake to eliminate heavy mountain grades in its vicinity.

Yards, engine terminals and shops continued to call for large expenditures during the year. The Illinois Central completed its new shops at Paducah, Ky., at a total cost of $8,500,000, while the new shops of the Reading, at Reading, Pa., were also completed. The Cleveland, Cincinnati, Chicago & St. Louis had under construction the extension of its Riverside yard and the installation of engine terminals at Cincinnati, Ohio, at a total cost of $3,796,000 and similar work at Anderson, Ind., to cost $1,175,000. The Baltimore & Ohio carried on extensive yard work at Cincinnati and other points in Ohio, while the Pennsylvania also expended large sums for yards, engine terminals and shops at various locations.

Among the important bridge projects completed or under way during the year was the beginning of construction of a bridge across Newark bay by the Pennsylvania and the Lehigh Valley, to cost over $4,000,000. The Delaware, Lackawanna & Western is replacing its double track bridge over the lower Hackensack river with a three-track lift bridge at a cost of $3,230,000. During the year, the Atchison, Topeka & Santa Fe completed its new bridge over the Mississippi river near Ft. Madison, Iowa, while the Louisville & Nashville is building three bridges near Mobile, Ala., at a total cost of $1,500,000.

Track elevation programs were continued by various roads at Philadelphia, Detroit, Mich., and Chicago, while the Chicago, Milwaukee & St. Paul started a $3,500,000 project of this character at Milwaukee, Wis. In addition, track elevation or other methods of grade crossing elimination were prosecuted in various other cities and elsewhere at an aggregate cost of many millions of dollars.

The new passenger station of the New York Central at Erie, Pa., was completed during the year, at a total cost of $3,000,000 and work continued on that road's terminal improvements at Buffalo, which will include a new passenger station, and will involve an expenditure of $14,000,000. The Pennsylvania completed the first unit of its office building at a cost of $3,300,000, as a portion of its extensive program in Philadelphia, and the Reading will begin work in 1928 on a new station in the same city. Definite arrangements have been completed for a new passenger terminal at Cincinnati, Ohio, and it is expected that construction will begin in 1928. The Boston & Maine will replace its North Station at Boston, Mass., with a modern structure, the project involving a total expenditure of $10,000,000. The Southern completed and placed in service its new station at Greensboro, N. C., at a cost of $1,170,000. In Canada the Toronto Terminal has placed in service the union station at Toronto, Ont., and the Canadian National has completed plans for a new passenger station at Montreal, Que.

One of the important freight handling facilities completed during the year is the l.c.l. freight transfer house of the Chicago & North Western at Proviso, Ill., which has a capacity of 690 cars at one setting and at which all the l.c.l. freight originating in Chicago is transferred to outgoing cars. The Reading, the Pennsylvania, the Erie, the Lehigh Valley, and the Lackawanna expended

large sums on their water front terminals at New York and Philadelphia and the Galveston Wharf Company installed extensive facilities at its wharves at Galveston, Tex. The B. & O. and the Reading completed their joint perishable products terminal at Philadelphia, involving an expenditure of $3,500,000, and a number of other roads, including the Pennsylvania, the New York, New Haven & Hartford, the Santa Fe, and the Michigan Central provided facilities of this character during the year.

Decrease in Mileage of Lines Abandoned

The mileage of lines abandoned in the United States in 1927 again showed a decrease from the preceding year, the total of 282 miles comparing with 457 miles in 1926 and 606 miles in 1925. Again, too, the mileage of new lines built exceeded the mileage abandoned by a margin but little smaller than in 1926, which year was the first in a decade when there was not an actual decrease in the total mileage of the country. In Canada the mileage abandoned was likewise smaller than in 1926, amounting to 55 miles as compared with 72 miles in the preceding year. The Manitoba Great Northern, a subsidiary of the Great Northern, took up the track on a line from West Gretna, Man., to Plum Coulee, on which operation was abandoned in 1926.

Railway Construction in the United States in 1927

Alaska Railroad

Important Work Undertaken: Construction of standard gage line to replace narrow gage line, Moose Creek, Alaska, to Premier coal mine, 3.9 miles (completed). Construction of steel bridges on main line, $185,000 (completed). Line changes and grade reduction on approaches to steel bridges on main line, $200,000 (completed).

Atchison, Topeka & Santa Fe System

First Track: Manter, Kan., to Kansas-Colorado state line, 8.56 miles. Kansas-Colorado state line to Pritchett, Colo., 47.25 miles. Pawhuska, Okla., to Fairfax, 27.32 miles. Porphyry, Cal., to Alberhill, 15.21 miles. (Panhandle & Santa Fe) White Deer, Tex., to Skellytown, 10.40 miles.
Second Track: Defiance, N. M., to New Mexico-Arizona state line, 13.95 miles. New Mexico-Arizona state line to Chambers, Ariz., 23.66 miles. (Panhandle & Santa Fe) Pampa, Tex., to Canyon, 73.49 miles.
Third Track: Ottawa Junction, Kan., to Tower "HU," 4.05 miles.
Important Work Undertaken: Change of line, Ojita, N. M., to Sulzbacher, (completed). Change of line, June, N. M., to Gise (completed). Reconstruction of Bazar branch, Kan. (80 per cent completed). Grade reduction, Ottawa Junction, Kan. (completed). Auction house and receiving yards, Chicago (completed). Enlargement of yard facilities, Chillicothe, Ill. (completed). New depot and yard changes, Abilene, Kan. (96 per cent completed). Yard changes, Chanute, Kan. (completed). Relocation of main line and re-arrangement of yard, Barstow, Cal. (50 per cent completed).

New coaling station, Galesburg, Ill. (projected). New reservoir, Galesburg, Ill. (projected). Additional water facilities, Augusta, Kan. (projected). New frog and switch shop, Newton, Kan. (90 per cent completed). Building for fire department and apprentice school, Topeka, Kan. (projected). Mechanical facilities, Emporia, Kan. (35 per cent completed). Extension of engine house, Clovis, N. M. (completed). Mechanical facilities, Oklahoma City, Okla. (completed).

New double track bridge over Mississippi river, Ft. Madison, Iowa (completed). New double track bridge over Des Moines river near Dumas, Mo. (completed). New bridge over Arkansas river near Mulvane, Kan. (80 per cent completed). Replacing three single track bridges with double track bridges and extending one of these bridges 198 ft., Augusta, Kan. (20 per cent completed). Renewing bascule bridge, Valley division, California (10 per cent completed). Renewing bascule bridge, Valley division, California (Projected for 1928). Replacement of bridge on Olive district, Los Angeles division, California (completed).

Raise of grade in connection with Cicero Avenue subway, Chicago (50 per cent completed). Viaduct at Key Road crossing, Turner, Kan. (projected for 1928). Branner Street viaduct, Topeka, Kan. (completed). Ninth Street viaduct, Los Angeles, Cal. (completed). Grade separation, Bandini, Cal. (completed).

(Gulf, Colorado & Santa Fe) Installation of tile drains (completed). Additional tracks in yard, Brownwood, Tex. (completed). Additional tracks in yard, Temple, Tex. (completed).

Atlanta & St. Andrews Bay

Important Work Undertaken: Line projected and surveyed, Dothan, Ga., to Columbus, 100 miles.

Atlantic Coast Line

First Track: Thonotosassa, Fla., to Dade City, 22.80 miles. Immokalee, Fla., southerly, 5 miles.
(Ft. Myers Southern) Naples, Fla., to Collier City, 15.83 miles.
Important Work Undertaken: Line under construction from 5 miles south of Immokalee, Fla., to Deep Lake, 23 miles.

Baltimore & Ohio

Second Track: Germantown, Md., to Barnesville, 4.5 miles. Dickerson, Md., to Point of Rocks, 7.0 miles; Storrs, Ohio, to Riverside, 2.2 miles.
Important Work Undertaken: New lines under construction, Hamilton Furnace, Ohio, to Woodsdale, and Middletown branch, Ohio, to South Middletown, together with reconstruction of 6 miles of branch line, $1,500,000 (85 per cent completed). New double track line in revised location, 4 miles, and 3 miles of second track, Germantown, Md., to Barnesville. New double track line in revised location, 1 mile, and 6 miles of second track, Dickerson, Md., to Point of Rocks. New freight yard and engine terminals, Cincinnati, Ohio, initial appropriation, $1,600,000 (70 per cent completed). New delivery tracks at Front street, Cincinnati, $103,000 (90 per cent completed). Enlargement of terminal yard, Rossford, Ohio, $1,120,000 (completed). New yard and water facilities, Indianapolis, Ind., $163,000 (90 per cent completed). Terminal yard and engine facilities, Ohio Junction, Ohio, $1,650,000 (25 per cent completed). Perishable products terminal, Philadelphia, Pa., (joint with Reading) $3,500,000 (completed). Change of line and track elevation, South Philadelphia, Pa., $4,400,000 (45 per cent completed). Extension of 10-ft. outfall sewer under tracks, Allegheny, Pa., $101,000 (completed). Reconstruction of two spans of bridge over Maumee river, The Bend, Ohio, $106,000 (completed). Reconstruction of bridge over storm water sewer, Brighton, Ohio, $110,000 (completed). Reconstruction of viaduct over Paint Creek and Detroit, Toledo & Ironton, Greenfield, Ohio, $335,000 (completed). Reconstruction of bridge, Lovett, Ind., $165,000 (30 per cent completed). Reconstruction of bridge, St. Joe, Ind., $180,000 (completed). Grade separation, National Pike, Elm Grove, W. Va., $370,000 (75 per cent completed). Grade separation, McKeesport, Pa., (B. & O. proportion) $270,000 (completed). Grade separation, Girard, Ohio, (B. & O. proportion) $210,000 (95 per cent completed). Grade separation, Bond Hill, Ohio, $370,000 (50 per cent completed).

Beaver, Meade & Englewood

First Track: Baker, Okla., to Hooker, 12 miles.

Belt Railway of Chicago

Important Work Undertaken: Track elevation between 93rd and 95th streets, Chicago, from Indiana avenue to Colfax avenue, including separation of grades with Illinois Central at Burnside, $4,675,000 (90 per cent completed).

Bessemer & Lake Erie

Important Work Undertaken: Widening channel between docks No. 1 and No. 4 and constructing new dock front on dock No. 1, Conneaut Harbor, Ohio, $916,600 (90 per cent completed). Grading, masonry and structures for change of line, Pardoe, Pa., to Coolspring $694,936, (95 per cent completed). Change of line, double track, Carter, Pa., to Enterprise, 2.47 miles, $397,450 (completed). Concrete overhead highway bridge, Shermansville, Pa., $118,564 (completed).

Bingham & Garfield

Important Work Undertaken: Industrial tracks, Bingham, Utah, $110,000 (completed).

Boston & Maine

Important Work Undertaken: Grade reduction, Mechanicville, N. Y., to Johnsonville, $175,000 (60 per cent completed). Revision of classification yard, including installation of car retarders, power operated switches and flood lighting, Mechanicville, N. Y., $380,000 (completed). Rearrangement of tracks, together with car retarders, flood lighting and new warehouse to improve l. c. l. freight station service, Boston, Mass., $5,000,000 (90 per cent completed). New yard for fruit and auction house, $229,000 (completed). Installation of 36-in. concrete pipe for drainage through heavy cuts, Winter Hill, Mass., to Somerville Junction, $104,000 (60 per cent completed). Reconstruction of bridges for heavier power, Boston, Mass., to Ayer, $158,157 (50 per cent completed). New machine and erecting shop, boiler washing system and other improvements, Springfield, Mass., $226.000 (completed). New North Station, Boston, Mass., total cost $10,000,000, initial appropriation, $1,100,000 (construction started).

Burlington, Muscatine & Northwestern

Important Work Undertaken: Rehabilitation of line from Muscatine, Iowa, to Burlington (formerly the Muscatine, Burlington & Southern), $600,000 (20 per cent completed).

Canadian National (U. S. A.)

Important Work Undertaken: (Grand Trunk Western System) Construction of belt line connecting the Detroit, Grand Haven & Milwaukee and the Pontiac, Oxford & Northern, 2.5 miles, Pontiac, Mich. Additional yard tracks to increase capacity by 614 cars, Pontiac, Mich. (completed). Re-arrangement and extension of yard tracks, Port Huron, Mich. Separation of grade at Telegraph road north of Pontiac (completed). Grade separation, Franklin street to Hale street, Detroit, Mich. Grade separation at Joseph Campau avenue, Detroit.

Central of Georgia

Important Work Undertaken: Reinforced concrete and steel viaduct, Bay street, Savannah, Ga., $480,000 (95 per cent completed).

Central Railroad of New Jersey

Third Track: Bound Brook Junction, N. J., to Somerville, 0.80 mile.
Fourth Track: Bound Brook Junction, N. J., to Somerville, 1.66 miles.
Important Work Undertaken: Completion of Newark Bay bridge over Newark bay between Bayonne, N. J., and Elizabeth, $13,543,875 (completed). Engine terminal Bethlehem, Pa., $750,000 (90 per cent completed). Tracks 6 and 8, Bethlehem, engine terminal to Allentown yard, and relocation of public road, $144,000 (85 per cent completed). Passenger terminal, Raritan, N. J., $619,580 (completed). Elimination of grade crossings, Perth Amboy, N. J., $2,000,000 (90 per cent completed). Elimination of grade crossings, Somerville, N. J., $1,262,896 (completed).

Chesapeake & Ohio System

First Track: Omar, W. Va., to end of line, 4.48 miles. Carter, Ky., to end of line, 1.75 miles. Gregg, Ohio, to Valley Crossing, 63.27 miles.
Second Track: Ranger, W. Va., to Lattin, 4.70 miles. Between Gregg, Ohio, and Waverly, 0.19 mile. At Apex, Ohio, 1.37 miles. Gregg, Ohio, to Valley Crossing, 57.38 miles.
Important Work Undertaken: Additional passing track, Gauley, W. Va., $215,000 (completed) Construction of new tunnel to replace old

tunnel, Greenwood, Va., $352,000 (18 per cent completed). Enlarge Red Hill tunnel and rebuild arch, Callaghan, W. Va., $214,000 (60 per cent completed). Rebuilding bridges, Newport, Ky., to Covington, grade separation through Covington, rebuilding Ohio River bridge at Covington and double tracking Cincinnati Interterminal Railroad, Cincinnati, Ohio $11,702,400 (10 per cent completed). New line under construction, Rupert, W. Va., to Duo, 12 miles.

Chicago & Alton

Important Work Undertaken: Extension of yard, Bloomington, Ill., $300,000 (completed). Spur tracks to serve strip mine near Wilmington, Ill., $150,000 (60 per cent completed). Subway, Cicero avenue, Chicago $195,000 (completed).

Chicago & Eastern Illinois

Important Work Undertaken: Replacement of 26 deck plate girders with 24 deck plate girders of heavier design, double track bridge 670 ft. long, Momence, Ill., $100,000 (completed). New outbound freight house, 40 ft. by 600 ft., Chicago, $165,000 (50 per cent completed).

Chicago & Illinois Midland

Important Work Undertaken: Rehabilitation of line from Pekin, Ill., to Springfield (formerly part of the Chicago, Peoria & St. Louis), $1,320,000 (completed).

Chicago & North Western

First Track: Brandon, S. D., to Empire, 12.13 miles. Redwater River Junction, S. D., to end of track, 3.74 miles.

Important Work Undertaken: Construction of single track connection from Wiscona, Wis., to point north of Whitefish Bay to permit abandonment of main line through Shorewood and Whitefish Bay, $1,700,000 (30 per cent completed). Additional yard tracks and teamways, Weber, Ill., $184,000 (completed). Additional yard tracks and facilities, Des Plaines, Ill., $100,000 (completed). New line to reach sugar beet territory, 3.75 miles, Belle Fourche, S. D., $165,000 (completed). New line to reach sugar beet territory, 12 miles, Nisland, S. D., $387,000 (completed). Additional tracks and pedestrian subway to serve Jockey Club, Arlington Heights, Ill., $100,000 (completed). Replacement of five 160-ft. spans in Mississippi river bridge, Winona, Minn., $195,000 (completed). Additions to tie treating plant, Escanaba, Mich., $138,750 (completed). New l. c. l. freight house and yard tracks, Proviso, Ill., $1,436,585 (completed). New freight office building, Proviso, Ill., $357,000 (completed). New power house and installation of direct steaming process, Chicago, $231,000 (80 per cent completed). Track elevation, with additional tracks and facilities, Chicago, $2,300,000 (60 per cent completed). Reconstruction of subway, account of widening of Peterson avenue, $150,000 (completed). Subway, Atwater road, Shorewood, Wis., $183,000 (10 per cent completed).

Chicago & Western Indiana

Important Work Undertaken: Track elevation, Dolton branch, from 115th street to 131st street, including separation of grades with Illinois Central at Kensington, Chicago, $1,500,000 (completed). Elevated team yard along Canal street, between 23rd and 29th streets, Chicago, $1,650,000 (90 per cent completed).

Chicago, Burlington & Quincy

Second Track: Bluff Siding, Wis., to Purdy, 11 miles, Diamond Bluff, Wis., to Prescott, 14 miles.

Important Work Undertaken: New passenger station, Lincoln, Neb., $715,607 (completed). Engine terminal, Chicago, $269,882 (20 per cent completed). Installation of heavier spans on Illinois river bridge, Beardstown, Ill., $127,550 (completed).

Chicago, Indianapolis & Louisville

Important Work Undertaken: Construction of locomotive repair shops, La Fayette, Ind., $275,000 (95 per cent completed).

Chicago, Milwaukee & St. Paul

Important Work Undertaken: Grade separation, involving depression of tracks, track elevation, relocation of team yard and freight house, and construction of classification and storage yard, Milwaukee, Wis., $3,500,000 (10 per cent completed. Track elevation between Irving Park boulevard and Elston avenue, Chicago, approximately 1.5 miles, $1,500,000 (50 per cent completed).

Chicago, Rock Island & Pacific

First Track: Tonkawa, Okla., to Ponca City, 13.20 miles. Lima, Okla., to Bowlegs, 4.50 miles. Fritch, Tex., to Stinnett, 19.80 miles. At Tucumcari, N. M., 0.43 mile.

Second Track: McFarland, Kan., to Jones, 22.63 miles.

Important Work Undertaken: New yard, Joliet, Ill., $102,000 (completed). Additional yard facilities, Armourdale, Kan., $150,000 (completed). Additional yard facilities, Oklahoma City, Okla., $100,000 (completed). Rearrangement and addition to yards, Shawnee, Okla., $150,000 (completed). Passing and yard tracks and facilities, Seminole, Okla., $162,000 (completed). Passing and storage tracks, account oil development, Indian Territory division $196,000 (completed). Increased water supply, Indian Territory division, $105,000 (completed). Completion of additional engine terminal facilities, Burr Oak, Ill., $485,000 (completed). Extension of locomotive repair shop, Silvis, Ill., $127,000 (completed). Track elevation, South Chicago line, $1,200,000 (85 per cent completed). Replacement of bridge over Fourth street, Davenport, Iowa, $116,000 (20 per cent completed). Replacement of bridge over South Canadian river with two 150-ft. through riveted truss spans on three new concrete piers, Council, Okla., $148,000 (20 per cent completed). New lines under survey, Stinnett, Tex., to Liberal, Kan., 90 miles, and Bowlegs, Okla., to South Canadian river, 25 miles.

Colorado & Southern

Second Track: (Ft. Worth & Denver City At Childress, Tex., 0.94 mile.

Important Work Undertaken: Change of location om main line between mile posts 165.70 and 171.87, in Wyoming, $300,000 (5 per cent completed).

(Ft. Worth & Denver South Plains) New line under construction, Estelline, Tex., to Dimmit, 132 miles, and Silverton, Tex., to Lubbock, 70 miles, $7,000,000 (60 per cent completed).

Cowlitz, Chehalis & Cascade

First Track: Cowlitz River, Wash., to Cowlitz, 6.5 miles.

Important Work Undertaken: Location made for extension of 37 miles beyond Cowlitz, Wash.

Delaware, Lackawanna & Western

Important Work Undertaken: Third and fourth main tracks, Boonville, N. J., to East Dover Junction, with elimination of grade crossings at three points, $2,674,953 (75 per cent completed). New freight house facilities, Binghamton, N. Y., $350,000 (completed). New three-track lift bridge over Hackensack river, Jersey City, N. J., $3,236,024 (75,- per cent completed). New ferry terminal, Hoboken, N. J. $307,254 (completed). Construction of new passenger station and facilities, relocation of main tracks, grading for third and fourth main tracks and grade crossing elimination at Barclay and Mill streets, Paterson, N. J., $838,094 (75 per cent completed).

Denver & Rio Grande Western

Important Work Undertaken: Recification of main track alinement in Colorado and Utah, $2,605,000 (completed).

Detroit & Toledo Shore Line

Second Track: Mile 4.15 to 7.72, Michigan, 3.57 miles.

Important Work Undertaken: Grade separation, Eureka road, Wyandotte, Mich., $120,000 (completed). Grade separation, Dearoad, Mich., $275,000 (completed). Macadam road and bridge over Ottawa river to divert highway from across tracks at Long yard, Toledo, Ohio, $102,000 (completed).

Detroit Terminal

Second Track: At Detroit, Mich., 0.98 miles.

Important Work Undertaken: Grade separation at Michigan ave., Detroit, $275,000 (75 per cent completed).

Detroit, Toledo & Ironton

Important Work Undertaken: Line under construction, Petersburg, Mich., to Malinta, Ohio. Second track under construction, Durban, Mich., to Petersburg, 9.87 miles (10 per cent completed). Electrification Flat Rock, Mich., to Petersburg (30 per cent completed).

Duluth & Iron Range

Important Work Undertaken: Relocation at Aurora, Minn., 1.68 miles double track, $168,000 (60 per cent completed). Relocation between Aurora, Minn., and Biwabik, 3.3 miles double track, $270,000 (60 per cent completed).

Erie

Important Work Undertaken: Relocation of approximately 6.5 miles of the Greenwood Lake branch and a portion of the Ringwood branch between Wanaque, N. J., and Midvale, on account of the construction of the Wanaque reservoir of the North Jersey District Water Supply Commission (90 per cent completed). Removal of state highway from close proximity to the Erie and New York Central between Oil City, Pa., and Reno (completed). Elimination of grade crossings at Montgomery, Lafayette, Franklin, Keen, River and Warren streets, Paterson, N. J. (90 per cent completed). Elimination of grade crossings at Fulton and Governor streets, Paterson, N. J., (50 per cent completed). Elimination of two grade crossings Franklin, N. J. (50 per cent completed). Elimination of East Buffalo street grade crossing by track elevation Jamestown, N. Y. (90 per cent completed). Elimination of grade crossings Akron, Ohio, joint with Pennsylvania and Baltimore & Ohio (85 per cent completed).

Florence, Clifton & Paducah

Line Projected: Florence, Ala., to Paducah, Ky., 226 miles.

Florida East Coast

First Track: Canal Point, Fla., to Belleglade, 11.1 miles.

Galveston Wharf Company

Important Work Undertaken: Two-story reinforced concrete warehouse, piers 23-26 Galveston, Tex., $1,000,000 (completed). Two-story reinforced concrete warehouse, pier 9, Galveston, $680,000 (90 per cent completed).

Georgia & Florida

Important Work Undertaken: Extension from Augusta, Ga., to Greenwood, S. C., 56.7 miles, (33 per cent completed).

Great Northern

First Track: Bend, Ore., to Chemult, 47.25 miles.

Important Work Undertaken: Replacing outer one-third of ore dock with concrete and steel, Allouz, Wis., $950,000. Line revision, 1½ miles west of Katka, Idaho, $335,000 (10 per cent completed). Cascade tunnel, 7.79 miles long, between Berne, Wash., and Scenic, $10,000,000 (65 per cent completed). Change of line, Peshastin, Wash., to Winton, $3,700,000 (30 per cent completed). Electrification, Appleyard, Wash., to Cascade tunnel, $1,200,000 (5 per cent completed).

Gulf, Mobile & Northern

First Track: Lena, Miss., to Pearl river, near Jackson, Miss., 39.6 miles.

Important Work Undertaken: Rehabilitation of existing line from Union, Miss., to Lena, 32 miles, and construction of extension, Lena to Pearl river near Jackson, Miss., 39.6 miles $2,000,000 (completed).

Illinois Central

First Track: Bridge Junction, Ky., to Fulton, 42.29 miles.

Important Work Undertaken: New lines under construction, Edgewood, Ill., to Metropolis, 119.90 miles, and Akin Junction, Ill., to West Frankfort, 6.93 miles. Suburban terminal at Randolph street, Chicago, $2,500,000 (50 per cent completed). Grade separation and track elevation, Jackson, Miss., $1,928,000 (completed). New shop facilities, Paducah, Ill., $8,500,000 (completed). Remodeling and enlarging passenger station, Jockson, Miss., $657,800 (90 per cent completed).

(Yazoo & Mississippi Valley) New passenger station and track elevation Clarksdale, Miss., $656,000 (completed).

Illinois Terminal

Important Work Undertaken: Line under construction, Formosa Junction, Ill., to O'Fallon, 4 miles.

Indianapolis Union

Important Work Undertaken: Elevation of 7 miles of the Belt Railway in accordance with a contract executed with the City of Indianapolis, Ind., involving a total expenditure of $13,000,000 (2.3 per cent completed).

Kanawha Central

First Track: Knickerbocker, W. Va., to Jones Mill, 0.5 mile.

Kansas City Southern

Important Work Undertaken: Grade reduction and reconstruction of 6.2 miles of double track, involving grade separation, Shreveport, La., $876,327 (34 per cent completed).

Kansas City Terminal

Important Work Undertaken: Construction of Van Brunt Boulevard subway, Kansas City, Mo., $290,000 (85 per cent completed).

Lehigh & New England

Second Track: Bath Junction, Pa., to Tadmor, 3 miles.
Important Work Undertaken: Construction of classification yard, with engine terminal facilities, Tadmor, Pa., $431,495 (completed).

Lehigh Valley

Important Work Undertaken: Double track tunnel to the south of the present Musconetcong tunnel between Pattenburg, N. J., and Portal (50 per cent completed). Bridge over Newark bay, Newark, N. J., (10 per cent completed). Raise of grade, new Oak Island yard, in connection with bridge over Newark bay, Newark, N. J. (5 per cent completed). New transfer bridge and slip, dock, dredging, etc., at East 149th street, New York (completed). New bulkhead and gantry crane west of Pier L, Jersey City (completed).

Long Island

First Track: Laurelton, N. Y., to Cedarhurst, 3.49 miles.
Second Track: Laurelton, N. Y., to Cedarhurst, 3.34 miles.
Important Work Undertaken: Concrete bulkhead 800 ft. in length along East river, Long Island City, N. Y., $235,000 (completed). Completion of elimination of grade crossings at Queens boulevard and Main street, Elmhurst, N. Y., $1,000,000 (completed). Completion of electrification of Bay Ridge branch, $2,650,000 (completed). New station, freight facilities and yards, Montauk, N. Y., $400,000 (completed).

Louisiana Railway & Navigation Company

First Track: Completion of line from Moreauville, La., to west bank of Mississippi river near Torras. 2.75 miles.
Important Work Undertaken: Steel bridge, 1,200 ft. long, over the Atchafalaya river, including a 300 ft. swing span, $1,200,000 (90 per cent completed).

Louisville & Nashville

Second Track: Conway, Ky., to Sinks, 12.88 miles. Lebanon Junction, Ky., to Elizabethtown, 13.90 miles.
Important Work Undertaken: New line under construction, Chevrolet, Ky., to Hagens, Va., 13 miles. Marine coaling plant on reinforced concrete wharf, capacity 600 tons per hour, Pensacola, Fla., $357,000 (completed). Brick and concrete freight house facilities, Mobile, Ala., $168,096 (50 per cent completed). Bridge 188, Mobile and Montgomery division, $1,000,000 (75 per cent completed). Bridge 189, Mobile and Montgomery division, $123,000 (25 per cent completed). Bridge 200, Mobile and Montgomery division, $500,000 (25 per cent completed). Completion of revision of line to eliminate steel viaduct, Cincinnati division, $254,000 (completed). Completion of roundhouse and facilities, Howell, Ind., $269,844 (completed). Completion of bridge No. 40, Cincinnati division, $225,000 (completed). Completion of bridge No. 41, Cincinnati division, $125,000 (completed).

Maine Central

First Track: Bath, Me., to Woolwich, 0.11 miles.

Meridian & Bigbee River

First Track: Meridian, Miss., to Mississippi-Alabama state line, 19.61 miles. Mississippi-Alabama state line to Cromwell, Ala., 10.39 miles.
Important Work Undertaken: Line projected from Cromwell, Ala., to Myrtlewood, 20 miles.

Minneapolis, Northfield & Southern

First Track: Minneapolis, Minn., to Crystal, 6 miles.

Minnesota Western

First Track: Lake Lillian, Minn. to Gluck, 32 miles.
Important Work Undertaken: Extension from Gluck, Minn. to Montevideo, 14 miles.

Missouri-Kansas-Texas

Important Work Undertaken: Construction of l. c. l. freight terminal, Houston, Tex., $883,000 (completed).

Missouri Pacific System

First Track: Nashville, Ark., to Peach Orchard, 9.57 miles. Wye connection, East Little Rock, Ark., 0.17 mile. Wye connection North Little Rock, Ark., 0.33 mile.
(St. Louis, Brownsville & Mexico) Raymondville, Tex., easterly, 18 miles.

Second Track: Berger, Mo., to Hermann, 4.00 miles. Washington, Mo., to Etlah, 8.85 miles. Isbell, Mo., to Osage, 3.75 miles. Algoa, Mo., to Jefferson City, 1.68 miles. Labaddie, Mo., to Washington, 1.65 miles. At Independence, Mo., 0.08 mile. Walnut Ridge, Ark., to Hoxie, 4.18 miles. Little Rock, Ark., to East Little Rock, 0.83 mile. At Little Rock, Ark., 0.59 mile. Smithton, Ark., to Bierne, 6.95 miles.

Third Track: At Little Rock, Ark., 0.48 mile.

Important Work Undertaken: Extension and rearrangement of yard tracks 9th street to 23rd street, St. Louis, Mo., $210,000 (completed). Improvement of yard and terminals, Osawatomie, Kan., $417,740 (completed). Construction and rearrangement of yard, Texarkana, Ark., $198,200 (completed). Purchase of property for team yard at Spring avenue, St. Louis, $181,000 (completed). Purchase of property for industrial development, Kansas City, $122,900 (completed). Raise of track and bridges with riprap bank protection and installation of cross drains and pipe culverts, Eastern division, between St. Louis and Kansas City, $449,310 (25 per cent completed). Raise of track and bridges, installation of additional openings and extension of bridges, Moody, Kan., to Neodesha, $192,000 (completed). Raise of track and bridges and construction of additional openings, Kansas City, Mo., to Omaha, Neb., $142,000 (50 per cent completed). Installation of tile drains in cuts, various locations, $255,680 (completed).

Reconstruction of bridge over Meramec river, Wickes, Mo., $192,000 (70 per cent completed). Reconstruction of substructure of bridge over Platte river, La Platte, Neb., $208,580 (completed). Strengthening pivot pier and installation of interlocking plant, bridge No. 18, New Augusta, Ark., $110,500 (60 per cent completed). Reconstruction of bridge No. 87, converting a fixed span into a lift span, Kragen, Ark., $174,300 (completed). Reconstruction of bridge No. 105, Riverton, La., $165,000 (70 per cent completed).

New office building, St. Louis, Mo., $3,000,000 (80 per cent completed). Purchase of grain elevator and construction of 1,000,000 bu.-storage, with drier, Omaha, Neb., $500,000 (80 per cent completed). New boiler, tank and blacksmith shop, St. Louis, Mo., $171,400 (95 per cent completed).
(St. Louis, Brownsville & Mexico) Construction of ballast deck trestle, 2,650 ft. long and raise of embankment over Sebastian floodway, Mile Post 36, $162,000 (completed).
(International & Great Northern) Additional yard and engine facilities, South San Antonio, Tex., $169,240 (completed.)
(San Benito & Rio Grande Valley) New lines under construction, San Benito, Tex., easterly, 18 miles; San Fernando, easterly, 6.5 miles; and La Paloma, southerly, 6 miles.

Mobile & Ohio

Important Work Undertaken: Grade revision near Ava, Ill., 2.5 miles, $210,000 (completed). Grade revision near Columbus, Ill., 2.5 miles, $100,000 (completed).

Monongahela

Important Work Undertaken: Remodeling passenger station, train shed Brownsville, Pa., $150,000 (completed).

Nashville, Chattanooga & St. Louis

Important Work Undertaken: Remodeling passenger station, train shed and tracks, Chattanooga, Tenn., $169,000 (completed). (Construction of new tunnel near Tunnel Hill, Ga., $495,000 (40 per cent completed).

New Orleans Great Northern

First Track: Nogan, Miss., to connection with Gulf, Mobile & Northern at Pearl River, near Jackson, Miss., 6.69 miles.
Important Work Undertaken: Construction of passenger and freight stations, yard and engine terminal facilities, Jackson, Miss., $400,000 (50 per cent completed).

New York Central System

First Track: (Cleveland, Cincinnati, Chicago & St. Louis) Cold Springs, Ohio, to Donnellville, 0.76 mile.
Second Track: Eagle Harbor, N. Y., to Medina, 6.80 miles.
(Cleveland, Cincinnati, Chicago & St. Louis) Kenton, Ohio, to Bellefontaine, 23.2 miles. Rapp, Ind., to Vance, 1.9 miles. Hart, Ind., to Williams yard, Muncie, 1.3 miles.
Third Track: (West Shore) New Durham, N. J., to West Englewood, 8.43 miles.
(Boston & Albany) West Warren, Mass., to Warren, 3.54 miles.
Fourth Track: (West Shore) New Durham, N. J., to West Englewood, 8.27 miles.
Important Work Undertaken: Construction of commercial office building, New York, $14,000,000 (12 per cent completed). New elevator and modification of elevators, Grand Central Terminal, New York, $160,000 (completed). Excavation, etc., for Grand Central Terminal north of 43rd street, $545,000 (completed). Terminal facilities and office building, north of 43rd street, $1,673,000 (99 per cent completed). New ticket office facilities, Grand Central Terminal, $252,000 (15 per cent completed). Rotary equipment for substation, Grand Central Terminal, $322,000 (75 per cent completed). Rotary convertor, 4,000 kw. at substation, Grand Central Terminal, $122,000 (completed). Rotary 4,000 kw. at substation, Mott Haven, N. Y., $107,000 (completed). Yard improvements, Mott Haven, $2,686,000 (12 per cent completed). Replacing cables between Port Morris, N. Y., and substation 7, $162,000 (completed). Duplicate intake tunnel at power station, Port Morris, $235,000 (50 per cent completed). Increasing electrical capacity of electrical appartus, Port Morris to Yonkers, $344,000 (completed). Retirement of storage batteries, substations 1, 2, 3 and 7, Electrical division, $618,000 (completed). Electrification of various yards and sidings, Mott Haven to Mt. Vernon, Melrose to Port Morris and High Bridge to Croton, $685,000 (completed). Electrification of 30th street branch, Spuyten Duyvil to Harmon, Spuyten Duyvil to West 30th street and Spuyten Duyvil to Dyckman street, and Dyckman street elimination, New York, $8,785,000 (50 per cent completed). Electrification of main line of Putnam division, Sedgwick avenue to Van Cortland Junction, also Yonkers branch, $1,416,000 (98 per cent completed). Rotary converter at substation and installation of additional high tension circuit, Tuckahoe, N. Y., $134,000 (25 per cent completed). Rotary converter and extension of building, substation 9, White Plains, N. Y., $155,000 (completed). Grade separation, St. Clair place to 138th street, New York, $3,250,000 (85 per cent completed). New lighting battery for substation 1-B, $285,000 (20 per cent completed). Highway bridge and station improvements, Fordham, N. Y., $500,000 (completed). Grade separation, Mosholu avenue, Van Cortland Park, N. Y., $120,000 (completed). Extension of Van Cortland Park, south, $181,000 (completed). Elimination of grade crossing, Mosholu avenue, Van Cortland Park, $120,000 (completed). Viaduct at 238th street, Wakefield, N. Y., $252,000 (projected). Third and fourth tracks, and reverse signals through Weehawken tunnel, New Durham, N. J., to West Englewood, $2,368,000 (completed). Grade separation, Englewood avenue, West Englewood, N. J., $180,000 (completed). Four tracking, West Englewood to Dumont, $1,455,000 (8 per cent completed). Grade separation, Newburgh, N. Y., $438,000 (completed). Grade separation, Nepperhan, N. Y., $282,000 (projected). Mechanical freight handling equipment, pier 3, Weehawken, N. J., $115,000 (completed). Strengthening Park avenue drawbridge, H-15, and replacing rail chairs on bridges H-14 and H-15, New York, $132,000 (completed). Strengthening floor system and installing improved rail chairs on bridge H-16, New York, $109,000 (completed).
Third and fourth tracks, Beacon, N. Y., to Garrison, $7,100,000 (18 per cent completed). Double tracking Falls Road, Rochester, N. Y., to Lockport, $1,525,000 (50 per cent completed). Third track, involving grade reduction and grade crossing separation, Voorheesville, N. Y., to South Schenectady, $3,445,000 (completed). Additional track at creosoting plant, Rome, N. Y., $112,000 (completed). Connections from main line to West Shore and Gardenville Branch to West Shore, Depew, N. Y., $1,700,000 (completed). Relocation of double track line to eliminate reverse curves and swing bridge and to separate grades, Port Clinton, Ohio, $1,703,000 (35 per cent completed).
Installation of car retarders, west bound hump, Selkirk, N. Y., $561,000 (completed). Extension of east bound classification yard and installation of car retarders, Gibson, Ind., $465,000 (completed). Enlargement of power plant and additions to engine terminals, Harmon, N. Y., $3,798,000 (40 per cent completed). Replacing bridge No. 70 in new location and construction of additional tracks, Philipse Manor, N. Y., $110,000 (completed). Alterations to engine terminals East Syracuse, N. Y., $516,000 (completed). New 100-ft. turntable, Rensselater, N. Y., $138,000 (completed). Alterations, West Shore engine house, East Buffalo, N. Y., $300,000 (completed). Additional generator and crane and replacing boilers in power house, Avis, Pa., $397,000 (completed). Replacing 85-ft. rigid turntable with 100-ft. 3-point support table, Collinwood, Ohio, $102,000 (completed). Extension of engine house and installation of boiler washout plant, Collinwood, $245,000 (20 per cent completed). Extension of power house and installation of new boiler and air compressor, Root street, Chicago, $145,000 (90 per cent competed).
Reconstruction of abutments, bridge 270, Barrytown, N. Y., $138,000

(projected). Reconstruction of abutments, bridge 270, Tivoli, N. Y., $100,000 (projected). Reconstruction of bridge 360, Clarks Mills, N. Y., $105,000 (50 per cent completed). Reconstruction of bridge 156, Knowlesville, N. Y., $139,000 (1 per cent completed).

Terminal improvements, Buffalo, N. Y., $14,000,000 (33 per cent completed). Traveling crane, 10-tons capacity, River Street freight house, Buffalo, $105,000 (completed). Freight house, North Tonawanda, N. Y., $138,000 (25 per cent completed). Passenger station, involving grade separation, Erie, Pa., $3,000,000 (completed).

Grade separation, Rochester, N. Y., $453,000 (completed). Grade separation, Oakfield, N. Y., $111,000 (completed). Grade separation, Brighton, N. Y., $315,000 (projected). Grade separation, Niagara Falls, N. Y., $1,367,000 (completed). Grade separation, Fairview, Pa., $118,000 (completed). Grade separation, Conneaut, Pa., $415,000 (85 per cent completed). Grade separation, Ashtabula, Ohio, $270,000 (completed). Relocation of track and state highway to eliminate two grade crossings, Reno, Pa., to Oil City (N. Y. C. proportion), $100,000 (completed). Grade separation, Collinwood, Ohio, $253,000 (50 per cent completed). Grade separation, Sandusky, Ohio, $350,000 (completed). Grade separation, Cleveland, Ohio, $190,000 (completed). Grade separation, Delroy, Mich., $125,000 (completed). Grade separation, Wyandotte, Mich., $115,000 (75 per cent completed). Grade separation and new freight house and team tracks, South Bend, Ind., total cost $8,000,000, present authorization, $3,725,000 (25 per cent completed). Grade separation, Gary, Ind., $250,000 (completed.

(Boston & Albany) Engine house and facilities, Worchester, Mass., $600,000 (85 per cent completed). Reconstruction of power plant, West Springfield, Mass., $426,500 (4 per cent completed).

(Michigan Central) Additional tracks in yard, Hartsdale, Ind., $107,-000 (completed). Fruit auction building, Detroit, Mich., $300,000 (completed). Grade separation, Campau avenue, Detroit, $430,169 (10 per cent completed). Grade separation, Wyandotte, Mich., $148,345 (completed). Grade separation, Grand Rapids, Mich., $137,000 (20 per cent completed).

(Cleveland, Cincinnati, Chicago & St. Louis) Revision of passenger tracks, additional yard and engine terminal, grade separation and electrification of terminal for westerly approach to Cleveland Union Terminal, $6,000,000 (projected). Extension of yard and construction of engine terminal and shops, Anderson, Ind., $1,175,000 (45 per cent completed). Extension of yard, Sharonville, Ohio, $1,241,000 (projected). Connecting track to Ohio Central Lines, Kenton, Ohio, 3.2 miles, $157,000 (completed). Extension of Riverside yard and construction of engine terminal, Cincinnati, Ohio, $3,796,000 (91 per cent completed). Consolidation of facilities of Big 4 and New York, Chicago & St. Louis for use as joint double track including passing track, 4,200 ft. long, 500-ton coaling station, interlocking and automatic signals, Altamont, Ind., to La Fayette, $235,000 (projected).

(Evansville, Indianapolis & Terre Haute) Relocation, 2.3 miles, to save 3.1 miles in distance and eliminate curvature, Washington, Ind., $214,000 (20 per cent completed).

(Pittsburgh & Lake Erie) Enlargement of freight terminal facilities, East Carson Street yard, Pittsburgh, Pa., $300,000 (completed). Improvements at terminal freight house, Pittsburgh, $100,000 (completed). New freight house facilities, Ellwood City, Pa., $200,000 (completed). Enlargement and revision of yard, Becks, Pa., $505,000 (85 per cent completed). Slag fill for proposed yard, Glassport, Pa., $145,000 (completed). New bridge over Monongahela river, McKeesport, Pa., total cost, $2,241,773 (P. & L. E. portion) $110,200 (80 per cent completed). Relocation of highway to eliminate grade crossings, West Economy, Pa., to Woodlawn, $218,000 (completed). Y. M. C. A. building, Newell, Pa., $185,000 (20 per cent completed).

(Indiana Harbor Belt) Purchase of land for new line, Blue Island, Ill., to McCook, $1,641,000 (75 per cent completed). Track elevation and change in alinement, Fifty-fifth street to Elsdon, Chicago $340,000 (96 per cent completed). Grade separation of Halsted and School streets, Riverdale, Ill., $347,500 (completed). Grade separation, Bellewood, Ill., $696,792 (2 per cent completed).

(Chicago Junction) Track elevation over 43rd and 47th streets, Chicago, $700,000 (15 per cent completed).

New York, Chicago & St. Louis

Second Track: Van Loon, Ind., to Osborn, 2.6 miles.

Important Work Undertaken: Construction of Standard Oil retaining wall, Cleveland, Ohio, $400,000 (15 per cent completed). Construction of Broadway retaining wall, Cleveland, Ohio, $100,000. Construction of freight house and team yard, Cleveland, Ohio, $200,000.

New York Connecting

Important Work Undertaken: Completion of electrification, Port Morris, N. Y., to Fresh Pond Junction, $500,000 (completed).

New York, New Haven & Hartford

First Track: At Saybrook, Conn., 0.40 mile. At Collinsville, Conn., 0.15 mile.

Important Work Undertaken: Extension of two tracks for the New York, Westchester & Boston, Mamaroneck, N. Y., to Harrison, $1,600,000 (completed). Extension of two tracks for the N. Y., W. & B., Harrison, N. Y., to Rye, $1,200,000 (completed). Revision of tracks and facilities for the N. Y. W. & B., Harlem River, N. Y., $431,800 (75 per cent completed). Additional classification tracks and other facilities, Cedar Hill, Conn., $210,000 (85 per cent completed). Completion of classification yard, Harlem River, N. Y., $110,000 (completed). Ten bulk tracks, with concrete driveways and drainage system, Harlem River, $215,000 (completed). Lighterage facilities Harlem River, $120,000 (completed). Relocation of freight facilities, Rye, N. Y., $125,000 (completed). Fruit terminal facilities including changes of existing buildings and tracks, Boston, Mass., $233,500 (completed). Revision of passenger yard tracks, Springfield, Mass., $152,000 (completed). Building and tracks for use of American Railway Express Company, Harlem River, $750,000 (40 per cent completed). Additional shop and engine facilities, Readville, Mass., $305,000 (90 per cent completed). Alterations and extension of car shops, New Haven, Conn., $101,000 (completed). Coaling facilities, 2,400-ton. capacity concrete pockets, Cedar Hill, Conn., $152,000 (completed). Rebuilding piers of viaduct and lift bridge, Bridgeport, Conn., $110,000 (completed). Dam, pipe line and pumping plant for power house, Cos Cob, Conn., $552,000 (completed). Additional boiler capacity at power house, Cos Cob, $500,000 (85 per cent completed). Additional capacity at shop power plant, Readville, Mass., $350,000 (completed). Central boiler plant, Boston, Mass., $600,000 (75 per cent completed). Central heating plant, South Boston, Mass., $556,000 (50 per cent completed).

Norfolk & Western

First Track: At Radford, Va., 0.07 mile.

Important Work Undertaken: Extensions to sidings, various locations, $933,855 (completed). Yard extensions, Williamson, W. Va., and Portsmouth, Ohio, $5,482,377 (completed). Car retarders, Williamson, $400,000 (completed). Second track, Winston-Salem, N. C., $132,400 (1 per cent completed). Yard extensions Winston-Salem, $663,500 (3 per cent completed). Yard extensions and improvements, various locations, $765,934 (completed). Bridge extensions and improvements, Cincinnati district, $285,500 (5 per cent completed). Culvert extensions, various points, $601,000 (completed). Shop buildings, Roanoke, Va., Williamson, W. Va., Portsmouth, Ohio, and Lamberts Point, Va., $2,314,500 (completed). Water supplies, various locations, $314,500 (completed). Elimination of grade crossings, various locations, $322,000 (completed). Elmination of grade crossings, Columbus, Ohio, $4,500,000 (5 per cent completed).

Northern Pacific

First Track: Mile Post 10, Idaho, to Headquarters, 30.14 miles.

Important Work Undertaken: New line, Glendive, Mont., to Brockway, 61.7 miles, $2,673,000 (45 per cent completed). Relocation of Bitter Root branch, Florence, Mont., to Hamilton, 24.9 miles, $1,057,000 (15 per cent completed). New power plant Mandan, N. D., $125,000 (85 per cent completed). Lengthening 12 stalls in roundhouse to 135 ft., Glendive, Mont., $150,000 (completed). Replacing bridge 20.6 near Townsend, Mont., for heavier power, $110,000 (completed). Water treating plants, North Dakota and Montana, $350,000 (25 per cent completed). Reconstruction of bridge across Mississippi river, Minneapolis, Minn., $300,000 (completed). Reconstruction of bridge over North Fork of Clearwater river, Ahsahka, Idaho, $116,000 (completed). Reconstruction of bridge, city waterway, Tacoma, Wash., (completed).

Oregon, California & Eastern

Important Work Undertaken: Extension from Sprague River, Ore., to Lakeview, 78.7 miles, Sprague River to Silver Lake, 65.4 miles, and Williamson branch from Silver Lake line, 15 miles.

Pennsylvania

First Track: At Trenton, N. J., 0.25 mile. At Pavonia, N. J., 0.85 mile. Connection with Bellefonte branch near Glen Iron, Pa., 2.82 miles. Branches at Weirton Junction, W. Va., 1.36 miles. At Clark, Ind., 0.18 mile.

Second Track: At South Oil City, Pa., 0.88 mile. At Erie, Pa., 2.63 miles. At River Ridge, Pa., 1.77 miles. At Springbrook, N. Y., 1.25 miles. Canton, Ohio, to Bayard, 13.85 miles. At Bayard, Ohio, 0.48 mile. At Niles, Ohio, 0.05 mile. Pierron, Ill., to St. Jacob, 12.65 miles. Casey Ill., to Schoyer, 9.67 miles. Woodbury, Ill., to Montrose, 3.08 miles. Altamont, Ill., to Brownstown, 10.69 miles.

Third Track: At Weirton Junction, W. Va., 0.61 mile.

Fourth Track: At Weirton Junction, W. Va., 0.75 mile.

Important Work Undertaken: Little Creek line, Norfolk, Va., $3,-115,000 (20 per cent completed). Low grade freight line, Canton, Ohio, to Bayard, $4,010,000 (completed). Relocation of main line through New Brighton, Pa., $3,325,000 (completed). Change of line, Glen Osborne, Pa., to Shields, $1,055,000 (completed). Freight line, Weirton Junction, W. Va., to Collier, $290,000 (completed). Receiving tracks, Grogan yard, Columbus, Ohio, $360,000 (completed). Freight yard, McCullough, Ohio, $380,000 (completed). Third track through station, Newark, N. J., $340,000 (completed). Revision of classification yard and installation of mechanical hump and longer track scales, East Altoona, Pa., $700,000 (completed). Additional storage tracks, Weirton Junction, W. Va., $410,000 (completed). Additional yard facilities, Mingo Junction, Ohio, $471,000 (85 per cent completed). Passing track extensions, Broadacre, Ohio, and Miller $300,000 (completed). Rearrangement and extension of yard, Rose Lake, Ill., $356,000 (completed). Additional tracks and rearrangement of Undercliff yard, Cincinnati, Ohio, $146,000 (completed). Additional tracks and facilities, Colehour yard, Hammond, Ind., $243,000 (60 per cent completed). Relocation of tracks, Renovo, Pa., to Keating, $125,000 (completed). Receiving and departure yard, Greenville, N. J., $695,000 (15 per cent completed).

Tank car repair shops, Altoona, Pa., $900,000 (completed). Modification of passenger car shops, Wilmington, Del., $295,000 (30 per cent completed). Coal and water facilities, with additional tracks, East Rochester, Ohio, $170,000 (completed). Additional engine and shop facilities, Shire Oaks, Pa., $335,000 (completed). Substation building, including rotary converter, etc., Sunnyside yard, Long Island City, N. Y., $105,000 (completed). Concrete coal wharf, 750-ton capacity, ash pits and inspection pits, Camden, N. J., $153,686 (33 per cent completed). Coaling station. 200-ton capacity, and relocation of ash pits, Conemaugh, Pa., $329,300 (completed). Smoke exhaust and washing system, Chicago, $230,000 (95 per cent completed).

Reconstruction of 32nd street tunnel, Philadelphia, Pa., $970,000 (completed). Renewal of bridge over Newark Bay, Greenville, N. J., $4,-175,000 (9 per cent completed). Reconstruction of bridge over Sister Creek, Angola, N. Y., $166,000 (completed). Reconstruction of bridge over Chesapeake & Delaware canal, Canal, Del., $275,000 (completed). Rebuilding bridge, Pittsburgh, Pa., $130,000 (completed). New bridge across Wabash river near Terre Haute, Ind., $1,010,000 (completed). Replacement of truss spans and trestle approach with deck girder spans near Seymour, Ind., $110,000 (completed). Renewal of bridge, Toledo, Ohio, $190,450 (completed). Renewal of bridge, Tiffin, Ohio, $149,560 (completed).

Reconstruction of overhead bridge, 59th street, Philadelphia, Pa., $380,000 (completed). Reconstruction of Bridge Street overhead bridge, Altoona, Pa., $100,000 (completed). Market street, overhead bridge, Marcus Hook, Pa., (three-quarters cost) $165,000 (completed). Viaduct at Liberty street and wall along Mahoning river, Girard, Ohio, $270,000 (completed). Overhead bridges at Exchange and Center streets and foot bridge at Buchtel avenue, Akron, Ohio, $582,000 (85 per cent completed). Reconstruction of overhead bridge, Fruitville pike, Lancaster, Pa., $105,000 (5 per cent completed). Grade separation, Manor, Pa., $190,000 (completed). Subway at Center street, Ashtabula, Ohio, $225,000 (completed). Grade separation, Dixmont, Pa., to Glenfield, $385,000. Track elevation, South Philadelphia, Pa., $3,125,000 (70 per cent completed). Grade separation at Dennison avenue, Cleveland, Ohio, $2,-605,000 (98 per cent completed). Grade separation, Indianapolis, Ind., $235,000 (completed). Grade separation, 51st to 59th streets, Chicago, $645,000 (64 per cent completed). Track elevation with subways at 43rd and 47th streets, Chicago, $645,000 (15 per cent completed). Grade separation, Toledo, Ohio, $480,000 (completed). Grade separation, South Dearborn road, Detroit, Mich., $161,500 (completed).

Railway Express terminal, with additional tracks, Long Island City, N. Y., $2,693,000 (completed). Extension to commissary building, Long Island City, N. Y., $335,000 (75 per cent completed). Stairway from concourse to exit concourse and cab ramp, Pennsylvania Station, New York, $300,000 (75 per cent completed). Extension of piers 27, 28 and 29, New York, $1,715,000 (completed). Tracks and platforms, Manhattan produce yard, Kearny, N. J., $1,025,000 (95 per cent completed). Reconstruction of pier K, Jersey City, N. J., $1,165,000 (completed). Enlarging facilities, Journal Square station, Jersey City, N. J., $745,000 (35 per cent completed). Coal handling facilities, Sodus Point, N. Y., $615,788 (completed). Passenger station, Uniontown, Pa., $99,500 (completed). Warehouse, Cleveland, Ohio, $190,000 (completed). Construction and alterations, Polk Street freight house, Chicago, for American Railway Express Company, $180,100 (90 per cent completed).

Pere Marquette

Second Track: Delray, Mich., to Rougemere yard, 2.03 miles. Mt. Morris, Mich., to McGrew, 3.47 miles.

Important Work Undertaken: New yard McGrew (Flint), Mich., $600,000 (completed). Engine terminal improvements, Saginaw, Mich., $250,000 (95 per cent completed). New car ferry slip and track changes, Port Huron, Mich., $130,000 (completed). Grade separation Michigan avenue, Detroit, Mich., (P. M. proportion) $307,500 (30 per cent completed). Grade separation, Shaefer road, Detroit, (P. M. proportion) $250,000 (completed).

Pittsburgh, Chartiers & Youghiogheny

Important Work Undertaken: Grade separation involving construction of viaduct, lowering of tracks and grade reduction in company's main track, Pike, Pa. Total cost $390,000, railway company's proportion, $86,000 (completed).

Quanah, Acme & Pacific

Important Work Undertaken: Construction of line, McBain, Tex., to Floydada, 30 miles, $1,000,000 (30 per cent completed).

Reading

Fourth Track: At Birdsboro, Pa., 1.47 miles.

Important Work Undertaken: Track to industrial plant, Bound Brook, N. J., $329,000 (20 per cent completed). Branch line, Cape May, N. J., to Cape May Point, $107,000 (80 per cent completed). Connection between Lebanon Valley and Steelton branches, Harrisburg, Pa., $550,000 (60 per cent completed). Change of alinement to eliminate viaduct 120 ft. high and 1,100 ft. long, Rington, Pa., $1,160,000 (completed). Fourth track, Monocay, Pa., to Birdsboro, $225,000 (completed). Additional passenger and freight facilities with elimination of grade crossing and construction of fifth track, Pottstown, Pa., $1,480,000 (10 per cent completed). Grade reduction, east bound track and double tracking, Shippensburg, Pa., to Lurgan, $384,000 (50 per cent completed).

New passenger and freight facilities and grade crossing elimination, Souderton, Pa., $151,000 (90 per cent completed). Installation of two 10-ton gantry cranes, also necessary dredging, fill and extension of pier "H," Port Richmond, Philadelphia, $280,000 (75 per cent completed). Construction of 2,500,000-bu. reinforced concrete elevator together with shipping pier and dredging of docks, Port Richmond; $3,850,000 (completed). Perishable products warehouse, Philadelphia (cost divided with Baltimore & Ohio) $3,500,000 (completed). Warehouse, Philadelphia, $250,000 (completed). New shop facilities, Reading, Pa., $712,000 (completed). Engine terminal facilities, Shamokin, Pa., $282,000 (completed). Engine terminal facilities, Cressona, Pa., $277,000 (10 per cent completed). Y. M. C. A. building, Reading, Pa., $275,000 (35 per cent completed).

Replacement of through span open-floor bridge with two spans through girders with solid floors, Port Clinton, Pa., $151,000 (completed). Replacement of portion of bridge north of Montoursville, Pa., $150,000 (completed). Extension of bridge over Swantora creek for third and fourth tracks, Hummelstown, Pa., $384,000 (completed). Replacement of three-span double track brick arch over Beaver creek with a two-span concrete box for four tracks, Hummelstown, $105,000 (completed). Bridge over Belmont avenue, Manayunk (Philadelphia) Pa., (cost divided with township and county) $156,500 (25 per cent completed). Elimination of grade crossings, Manayunk, $4,500,000 (10 per cent completed). Replacement of stone arch with girder spans, Rising Sun avenue, Philadelphia (cost divided with city), $116,000 (completed). Grade crossing elimination at Easton road, Glenside, Pa., (cost divided with township and county) $323,000 (20 per cent completed). Reconstruction of bridge on Kings Highway, Haddon Heights, N. J., (cost divided with county) $118,300 (completed). Elimination of six grade crossings between Emaus, Pa., and Macungie (cost divided with State Highway department, county and two boroughs) $218,000 (20 per cent completed).

Important Work Projected: New station facilities, Philadelphia, Pa., $1,700,000. Elimination of grade crossing at 61st street on Chester branch, Philadelphia, $303,000. Additional freight facilities at Front and Noble streets, Philadelphia, $103,000. Extension of East Trenton branch, East Trenton, N. J., $200,000. Change of alinement and replacement of viaduct, Mainville, Pa., $260,000.

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Change of line and new bridge at Powell's Creek, near Cherry Hill, Va., $750,000 (10 per cent completed). Completion of double track concrete arch bridge over Rappahannock river and track elevation, eliminating four grade crossings, Fredericksburg, Va., $1,000,000 (completed).

Rio Grande, Micolithic & Northern

First Track: Micolithic, Tex., to Mico, 6.48 miles.

St. Louis-San Francisco System

First Track: East Aberdeen, Miss., to Mississippi-Alabama state line, 39.23 miles. Alabama-Mississippi state line to Aliceville, Ala., 18.26 miles.

Second Track: (Kansas City, Ft. Scott & Memphis) Harvard, Ark., to Marion, 4.81 miles.

(Kansas City, Memphis & Birmingham) Memphis, Tenn., to Yale, 2.86 miles.

Important Work Undertaken: Enlarging engine terminals, Tulsa, Okla., $400,000 (completed).

(Kansas City, Memphis & Birmingham) New engine terminal, Yale, Tenn., $760,000 (85 per cent completed).

Savannah & Atlantic

Important Work Undertaken: Grade reduction between Savannah, Ga., and Camak, $140,000 (80 per cent completed).

Seaboard Air Line

First Track: (Seaboard-All Florida) Miami (Hialeah Junction), Fla., to Homestead, 30.48 miles.

(Seaboard, Naples & Gulf) Ft. Myers, Fla., to La Belle, 30.66 miles. Punta Rassa Junction, Fla., to Punta Rassa, 8.61 miles.

Important Work Undertaken: Completion of Yeomans yard, Tampa, Fla., $200,000 (completed).

Southern System

Important Work Undertaken: Industrial belt line, Birmingham, Ala., $252,000 (completed). Freight yard, Chattanooga, Tenn., $1,053,000 (completed). Extension to freight yard, Columbia, S. C., $400,000 (completed). Extension to freight yard, Pomona, S. C., $330,000 (completed). New yard and engine terminal, Winston-Salem, N. C. $800,000 (completed). New freight facilities, Charlotte, N. C., $127,000 (completed). Engine terminal, Chattanooga, Tenn., $1,450,000 (completed). Engine terminal, Jacksonville, Fla., $640,000 (completed). Engine terminal, Columbia, S. C., $900,000 (completed). Passenger station, Greensboro, N. C., $1,171,000 (completed). Water supply, Spencer, N. C., $212,000 (completed), East Third Street viaduct, Chattanooga, Tenn., $305,000 (completed). Broadway viaduct, Knoxville, Tenn., $119,000 (completed). New freight facilities, Ashevile, N. C., $229,000. Engine terminal, Macon, Ga., $953,000. Fourth Street underpass, Louisville, Ky., $120,000.

Southern Pacific System

First Track: Edinburg, Tex., to McAllen, 8.5 miles. Harlingen, Tex., to Brownsville, 30.0.

Second Track: (Pacific Lines) San Luis Obispo, Cal., to Hadley tower, 7.16 miles, Ambrust, Cal., to Akers, 2.56 miles.

Important Work Undertaken: (Nevada-California-Oregon) Widening to standard gage: Wendel, Cal., to Surprise, 110.2 miles (completed). Widening in progress Surprise, Cal., to California-Oregon state line, 30.4 miles; and California-Oregon state line to Lakeview, Ore., 14.7 miles.

(Pacific Lines) Relocation of part of Mina branch between Monola, Cal., and Aberdeen, account construction of dam by city of Los Angeles, 6.9 miles (25 per cent completed). Additional yard tracks and facilities, Watsonville Junction, Cal., (91 per cent completed). Additional yard tracks and facilities, Santa Clara, Cal. (90 per cent completed). Drill track and sidings, Rupert, Cal., (completed). Additional yard tracks, Eugene, Ore. (completed). Additional yard tracks, Roseville, Cal. (completed). Freight yard and engine terminal, Klamath Falls, Ore. (completed). Storage yard in industrial district, San Francisco, Cal. (completed). Freight station and facilities, Bakersfield, Cal. (completed). Reinforcing steel bridge over Rio Grande river, El Paso, Tex. (completed). Replacement of bridge over San Pedro river, between Fairbank, Ariz., and Benson Junction (completed). Replacement of bridge over San Pedro river, Benson, Ariz. (completed). Construction of concrete shed, 1,645 ft. long, over track between Abernethy, Or., and Frazier (90 per cet completed). Tropical fruit warehouses on wharf at San Francisco, Cal. (completed). (Morgan's Louisiana & Texas Railroad & Steamship Company) Fruit warehouse and tracks, New Orleans, La., $165,520 (75 per cent completed).

(Galveston, Harrisburg & San Antonio) Relocation of main line between Langtry, Tex., and Osman, 9.36 miles, $874,938 (completed).

(Houston & Texas Central) New freight station and tracks, Dallas, Tex., $675,900 (completed). New engine terminal facilities, Miller Yard, Tex., $290,000 (completed).

(San Antonio & Aransas Pass) Reconstruction of yard, Houston, Tex., $135,176 (75 per cent completed). New passing tracks and extension of all passing tracks, Skidmore, Tex., to Falfurrias, $140,120 (completed).

(Houston & Shreveport) Extend yard and construct overhead crossing with Kansas City Southern, Shreveport, La., $335,684, (5 per cent completed).

Terminal Railroad Association of St. Louis

Important Work Undertaken: Additional tracks and roadways, East St. Louis, Ill., $265,000 (completed). Reinforced concrete viaduct, Kingshighway, St. Louis, Mo. (railroad's portion) $130,000 (completed).

Texas & Pacific

Important Work Undertaken: Extension of Cisco & Northeastern, Breckenridge, Tex., to Throckmorton, 37 miles. Double track in Louisiana, 32 miles, $818,000. Change in grade and alinement to reduce grade and provide reservoir for water supply, Bennetts, Tex., $128,000 (completed). Improvements, car shops, Marshall, Tex., $103,000 (75 per cent completed). New freight terminal, Tremble, Tex., $2,500,000 (60 per cent completed).

Texas Pacific-Missouri Pacific Terminal of New Orleans

Important Work Undertaken: Completion of freight yard and engine terminal facilities, Gouldsboro, La., total cost, $1,800,000 (completed).

Union Pacific System

First Track: (Union Pacific) Sears, Neb., southwesterly, 3.44 miles. Sears, Neb., southerly, 2.59 miles.

Second Track: (Union Pacific) Near North Platte, Neb., 0.45 miles. At Junction City, Kan., 0.13 miles.

(Oregon Short Line) Dietrich, Idaho, to Shoshone, 7.35 miles. Minidoka, Idaho, to Max, 1.34 miles.

Important Work Undertaken: Line under survey, Creighton, Wyo., to connection with main line near Burns, 54 miles. New engine terminal facilities, Ogden, Utah, $260,000 (completed). Completion of new passenger and freight stations, Topeka, Kan., $400,000 (completed). Completion of subway under tracks on 38th street, between Walnut and Wynkoop streets, Denver, Colo., (U. P. proportion of cost) $160,000 (completed). Extension of abutments and piers and additional girders for second track, bridge No. 282.03 near North Platte, Neb., $260,000 (completed). Completion of replacing bridge No. 52.62 near Perry, Kan., $620,000 (completed).

(Oregon Short Line). Construction of run-around track for freight trains, including two 80-ft. double track spans over Weber river, 1.38 miles, Ogden, Utah, $154,580 (completed).

(Oregon-Washington Railroad & Navigation Company) Ferry facilities at Astoria, Ore., and Megler, Wash., including construction of 1.65 miles of automobile road at Megler, $150,000 (completed).

(Los Angeles & Salt Lake) Completion of reinforced concrete viaduct over Los Angeles river and L. A. & S. L., and A. T. & S. F. tracks, Los Angeles, Cal. (L. A. & S. L. proportion) $535,000 (completed). Completion of grade separation at Downey road, Los Angeles, $153,000 (completed). Trackage, with necessary streets and sewers, to serve Metropolitan Warehouse District, Los Angeles, $140,000 (40 per cent completed). Trackage with necessary street and sewer improvements, to serve industrial development, Wilmington, Cal., $431,000 (70 per cent completed). Replacement of bridge No. 15.04 over San Jose creek near Clayton, Cal., $105,000 (50 per cent completed). Replacement of bridge No. 13.11 over San Jose creek near Bartolo, Cal., $158,000 (completed). Enlargement and lining with reinforced concrete, tunnel No. 18 near Acoma, Nev., $100,000 (completed). Enlargement to standard double track section and lining with reinforced concrete, tunnel No. 12 near Eccles, Nev., $203,000 (completed). Enlargement to standard double track section and lining with reinforced concrete, tunnel No. 11 near Eccles, Nev., $517,000 (50 per cent completed). Acquisition of land and construction of employees' club house equipped with dining, sleeping and recreation facilities, Caliente, Nev., $100,000 (50 per cent completed).

Virginian

Important Work Undertaken: Additional yard tracks, Sewells Point, Va., $142,000 (completed). Extending passing tracks, various locations, $300,000 (95 per cent completed). Enlarging tunnel for double track and lining with concrete, Mile Post 379.4, $163,000 (25 per cent completed). Lining tunnel with concrete, Sewalls Gap, Va., $110,000 (75 per cent completed). Replacing timber bridges with permanent structures, Mile Posts 40.98 and 52.7, $135,000 (85 per cent completed).

Wabash

Second Track: Adrian, Mich., to Britton, 12 miles.

Important Work Undertaken: Bank protection on Missouri river, De Witt, Mo., $100,924 (completed). Reconstruction of Vandeventer Avenue bridge, St. Louis, Mo., $143,841 (completed). Reconstruction of Livernois Avenue bridge, Detroit, Mich., $160,647 (completed). Grade separation, Raupp road, Detroit, $577,492 (completed). Additional elevator facilities and additional track for elevator $608,000 (completed).

Waco, Beaumont, Trinity & Sabine

Important Work Undertaken: Extensions projected, Weldon, Tex., to Waco, 109 miles, and Livingston, Tex., to Port Arthur, 100 miles.

Western Pacific

First Track: Kingdon, Cal., to Terminus, 7.80 miles.

Important Work Undertaken: Replacement of 16 50-ft. girder spans on pile piers with 4 150-ft. and 2 100-ft. through truss spans on concrete piers. Yuba river, Marysville, $235,000 (95 per cent completed). Replacing 12 timber trestles, aggregate length 1,471 ft., with steel spans and concrete structures between Weso, Nev., and Alazon, $210,953 (completed). Construction of 15 passing sidings, total length 23,600 ft. and extensions of 5 passing sidings, aggregating 21,300 ft., various locations $134,100 (completed).

Winston-Salem Southbound

Important Work Undertaken: Relocation of 5 miles of main line between Southmont, N. C., and High Rock, on account of hydro-electric development (completed).

Railway Construction in Canada

Canadian National

First Track: St. Felicien, Que., to Mistassini, 26.6 miles. Shellbrook, Sask., westerly, 60 miles. Connection between old lines of Canadian Northern and Grand Trunk Pacific, near Solomon, Alta., 3.97 miles.

Important Work Undertaken: New lines under construction: Weyburn Sask., to Radville, 22.7 miles; Spruce Lake, Sask., westerly, 29.5 miles; Shellbrook, Sask., westerly, 29.0 miles; Turtleford, Sask., southeasterly, 36.5 miles; Sturgis, Sask., to Peesane, 99.5 miles; Willowbrook, Sask., northwesterly, 22.0 miles; Elk Point, Alta., easterly, 19.0 miles; and Ashmont, Alta., to Bonnyville, 38.0 miles. Rehabilitation of old line of the Grand Trunk Pacific from near Abed, Alta., to near Solomon, including construction of new steel bridge over Athabaska river, 25.74 miles (completed). Completion of new yard, Niagara Falls, Ont. Construction of loop line approximately 6 miles long to eliminate back-up movement of main line passenger trains, Saskatoon, Sask. Extension of roadway on Terminal avenue and filling of False Creek for future terminal facilities Vancouver, B. C. Construction of sea wall and grading for re-arrangement of terminal facilities, Charlottetown, P. E. I. Replacing wooden crib with concrete crib for embankment protection along St. Lawrence river, various locations, Murray Bay sub-division, Que. Filling timber trestle, Mile 17.1 Clearwater sub-division, Alta.

Construction of locomotive erecting shop and machine shop, at St. Charles shops, Montreal, Que. Construction of new passenger and baggage building for additional immigration facilities, Halifax, N. S. Construction of steel train shed, with necessary tracks, paving, etc., St. Johns, N. B. New passenger station with auxiliary buildings, Edmonton, Alta. Track elevation along water front, Toronto, Ont. Addition to Chateau Laurier Hotel, Ottawa, Ont. Additions to Jasper Lodge Hotel, Jasper, Alta.

Canadian Pacific

First Track: Lanigan, Sask., northeasterly, 23.5 miles. Asquith, Sask., to Cloan, 23.3 miles. Moose Jaw, Sask., southwesterly, 28.4 miles. Rosemary, Alta., northerly, 13 miles. Cutknife, Alta., to Whitford Lake, 64 miles. Cassils, Alta., southerly, 23.4 miles. Gem Colony, Alta., 9 miles.

Second Track: Molson cut-off, Man., 31.6 miles.

Important Work Undertaken: New lines under construction: Foam Lake, Sask., southwesterly, 25 miles; Rosetown, Sask., to Perdue, 21 miles; Rosemary, Alta., northerly, 12 miles; and Rosedale, Alta., to Bull Pound, 32 miles. Freight yard extension, Brandon, Man., $145,000 (completed). Extension to blacksmith shop, Winnipeg, Man., $110,000 (completed). New hotel, Royal York, Toronto, Ont., $15,000,000 (15 per cent completed). New south wing, building for help's quarters and new 18-hole golf course at Banff Springs Hotel, Banff Springs, Alta., $3,690,000 (50 per cent completed). Alterations and additions to Vancouver hotel, Vancouver, B. C., $750,000 (completed).

Hudson Bay Railway

First Track: Mile 332 to mile 356, 24 miles.

Important Work Undertaken: Construction of line from Mile 356 to Ft. Churchill, Man., 154 miles. Rehabilitation of existing line from Mile 0. The Pas, Man., to Mile 332. Line projected. The Pas to the Flin Flon mining district, in Northern Manitoba, 85 miles.

Michigan Central

Important Work Undertaken: Strengthening bridge near Cornell, Ont., $137,200 (10 per cent completed). Extension of engine house and boiler room, Windsor, Ont., $127,500 (completed).

Pembina Valley

First Track: Busby, Alta., to Barrhead, 26.5 miles.

Temiskaming & Northern Ontario

First Track: Chenimis, Que., to Rouyn, 27 miles. Mile 68, north of Cochrane, Ont., to mile 82, north of Cochrane, 14 miles.

Important Work Undertaken: Extension from Mile 82 north of Cochrane, Ont., 15 miles.

Toronto, Hamilton & Buffalo

Important Work Undertaken: Grading and subway for double track between Stoney Creek, Ont., and Lees Mountain Road, East Mountain, $140,000 (50 per cent completed). Coal handling facilities, including anchorage, coal dock, yard facilities and grade reduction, Port Maitland, Ont., $391,000 (90 per cent completed).

Railway Construction in Mexico

Mexican Railway

Important Work Undertaken: Electrification, Cordoba, V. C., to Paso del Macho, 18.6 miles, $500,000 (75 per cent completed).

Southern Pacific of Mexico

First Track: End of track to Salsipuedes bridge (completion of main line, 4 miles).

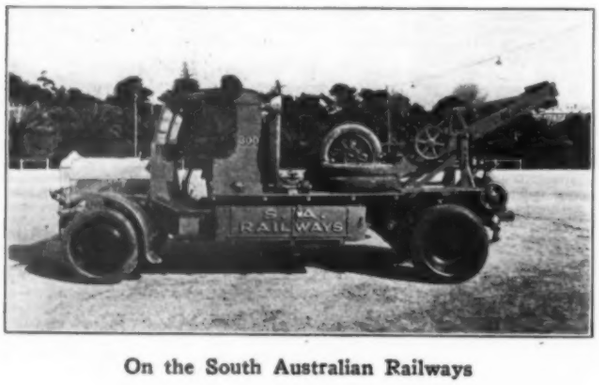
Important Work Undertaken: Construction of roundhouse and yard, Guadalajara, Jal., $215,116 (completed). Reconstruction of 18 miles of grading and bridges on the main line in Sonora, destroyed during the revolution and by washouts, $330,000 (completed). Reconstruction of 97 miles of Tonichi branch, Sonora, destroyed in the revolution, $222,000 (98½ per cent completed). Reconstruction of 38 miles of Alamos branch, Sonora, destroyed in the revolution, $173,000 (98 per cent completed).

National Railways of Mexico

First Track: (Mexico-Tampico Short Line). In the state of Tamaulipas, 0.84 mile. In the state of Vera Cruz, 24.01 miles.

Second Track: From K. 104+079, Jiminez to Rosario line, to San Francisco del Oro, Chih., 7.42 miles. K. 516 (Mexico to Laredo), to Villa de Pozos, S. L. P., 2.63 miles.

Important Work Undertaken: Storage yards for untreated and treated timber, with capacities of 400,000 and 200,000 ties, respectively, together with necessary tracks at timber preservation plant at Acambaro, Gto., $274,326 (90 per cent completed). Storage yards for untreated and treated timber, with capacities of 400,000 and 200,000 ties, respectively, together with necessary tracks at timber preservation plant at Durango, Dgo., $202,836 (90 per cent completed). Removal of timber preservation plant from Auguascabientes, Ags., to Acambaro, Gto. This plant has a present capacity of 98,000 ties monthly, and it is proposed to increase its capacity to 260,000 ties monthly. By the installation of new equipment, it will be fitted to use any known method of treatment (projected). New timber preservation plant at Durango, Dgo., with a maximum capacity of 120,000 ties monthly (completed). New repair shops and engine terminals at Monterrey, N. L., $1,000,000 (20 per cent completed). Extension of grounds and tracks for new repair shops and engine terminals at Monterrey, $476,389 (projected).



On the South Australian Railways

Gondola Built by Ryan Car Company

Railway Finances in 1927

Security price averages continue to advance, encouraging new financing with both stocks and bonds

By Charles W. Foss
Financial Editor, *Railway Age*

AN increase in the average price of railroad stocks of about 20 points, a similar increase of about 5 points in the average price of railroad bonds, a further substantial increase over 1926 in dividend disbursements, a large number of instances of profitable refunding operations at lower rates of interest, and a restoration of the ability of prosperous railroad companies to raise money by the sale of stock were included among the outstanding factors that characterized 1927 as an unusually favorable year from the standpoint of railway finances.

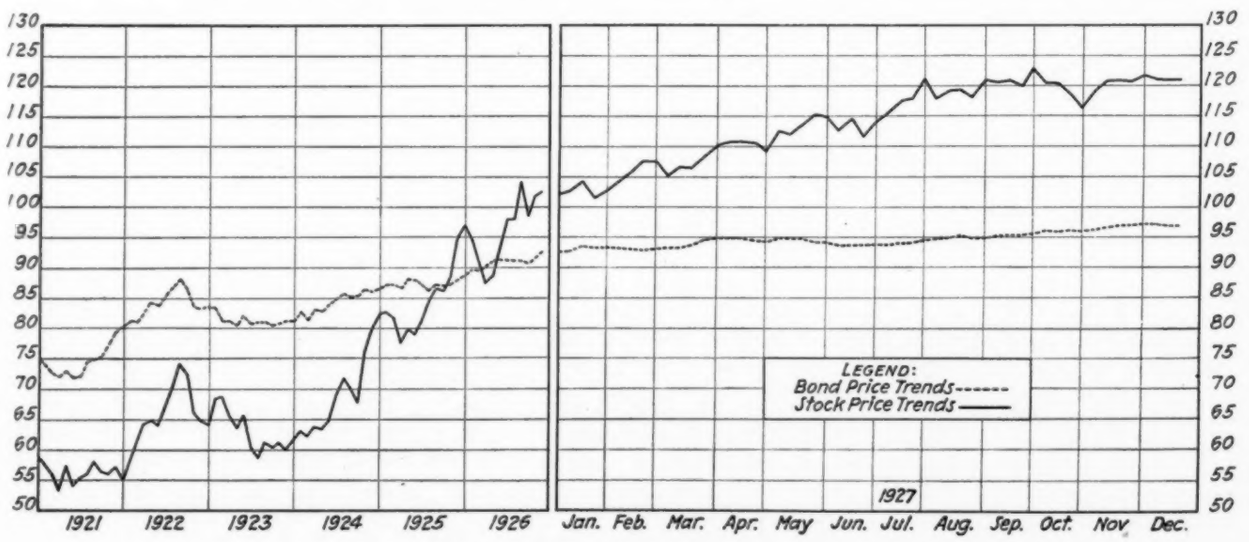
Throughout most of 1927 the railroad stocks maintained a position of leadership in the stock market, both from the standpoint of the conservative investor and the speculative trader. A somewhat similar condition ruled during much of 1926. It received due consideration in the reviews of that year's activity and was particularly remarked as being in decided contrast with the lack of interest in any but the very best railroad securities which had been noteworthy in the years immediately following federal control. At the end of 1926 the average price of railroad stocks, according to the *Railway Age* compilation, was about double what it was during most of 1921 and only a few points short of being twice what it was even at the end of 1923. It was believed, therefore, in many quarters that the increased price trend had about culminated. If there was reason to point a year ago to the contrast between 1926 and preceding years in respect to the favor shown towards railroad securities, the additional 20-point rise during 1927 can only emphasize that contrast.

20-Point Rise in Stock Prices

The steadiness of the rise in railway security values during 1927 above even the high prices reached in 1926 has led many observers to take an entirely different view from that which was held in most quarters at this time last year. The belief noted above as being then held that the price rise had culminated has been succeeded by a supposition held by many people that the prices of railroad stocks are likely to go to still higher levels during 1928. Whether this supposition is going to prove to have been justified is not the question so much as the interesting way in which it reflects the confidence of investors in the railway issues. Thus, at the present moment, such of the railroad stocks as are regarded as having standing as conservative investments, are selling at prices giving a return of about 5 per cent. Those who look for higher prices in the future point to the possibility of money available for investment becoming so plentiful that purchasers of high-grade stocks will have to be satisfied with yields amounting to 4½ or ultimately even of only 4 per cent on current values. If these estimates of the situation are correct the result will be much higher prices of stocks than rule at present. It is noteworthy that the analysts always include the better railroad stocks as the issues most likely to be affected by a trend of this kind. In hardly any better way than by this last noted fact could the favor in which railroad stocks are now held be more adequately indicated.

Highest Prices in Over 30 Years

The average price of 20 leading railroad stocks which the *Railway Age* has been compiling since January, 1921, stood at the close of business on December 27, 1927, at 121.09. This was near the highest figure the *Railway Age* average has ever reached. The first week in December the average was 121.78 and in the first week in October the average reached the



Average Prices of 20 Leading Railway Stocks and 20 Representative Railway Bonds, 1921 to 1927

year's high of 122.68. In general, the trend was upward for almost the entire year. This is evident from the curve of stock prices shown on the chart and by the fact that the low for the year was in January, in which month the average stood at about 102.

Of even greater interest is the manner in which the railway stock price curve has had a steady upward trend during the past seven years. This is strikingly apparent in the chart.

There are various other indexes of the prices of railway stocks that can be carried back to earlier years. The famous Dow, Jones average of 20 railroad stocks, for example, is at its highest for a period of at least 30 years. This particular average also shows a rise of about 20 points during 1927. It shows an advance over 1921 of about 70 points and the same doubling of values that the *Railway Age* average shows. The three best years in the 30-year period outside of 1927 were 1902, 1906 and 1909. The increase over the high of the Dow, Jones average in 1902 amounts to about 10 points. There is an increase over the high of 1906 of only about 2 points and over the high of 1909 of about 8 points. There is a 30-point rise over the average prices ruling in 1916.

There are several good reasons why the prices of railroad stocks should be as high as they are at present. The effect of the cheaper value of money has already been mentioned as a factor tending to increase the value of securities having high-grade investment worth. The acquisition of large amounts of railroad stocks of this character by the investment trusts which have been organized in increasing numbers in the last year or two is credited as having had considerable effect on prices because it has tended to decrease the floating supply of the issues involved.

Speculative Interest

During 1927 there was much speculative interest in the railroad stocks. In the earlier part of the year this was directed chiefly towards the stocks of the smaller companies having merger possibilities. This interest reached its climax in the near-corner of the stock of the Wheeling & Lake Erie in February incident to the acquisition of control of the company by the New York Central, the Baltimore & Ohio and the Nickel Plate. A large group of stocks was affected, including notably the Western Maryland, a large interest in which was later found to have been acquired by the Baltimore & Ohio; and including also the Lehigh Valley, the Chicago Great Western, the Wabash and others. As the year pursued its course various adverse decisions of the Interstate Commerce Commission began to make it evident that that body was unlikely to approve mergers under the law as it stands. Merger possibilities gradually disappeared as a stock market factor and the prices of most of the merger stocks fell back to former levels.

Later in the year speculative interest began to turn towards the high grade railway investment stocks. It was attracted by the general tendency of prices to advance, by reports of improved earnings, by rumors of increases in dividend rates and by expectations of announcements of sales of stock at prices yielding valuable rights to present stockholders. The results of the speculative interest of this kind were particularly shown in the group of high-grade stocks paying 10 per cent dividends. Thus, at one time or another the price of one or another of these issues was raised entirely out of parity with the others. Atlantic Coast Line common was carried to 205½; Atchison, Topeka & Santa Fe reached a high at a different time of 200, while on other occasions Norfolk & Western reached 202, Chesapeake & Ohio 218½ and Canadian Pacific 219. New York Central, which pays 8 per cent dividends, was similarly at one time a center of interest and as a result sold at 171½.

Long Time Trends

There are several factors of interest from the standpoint of the long-time trend. Speaking generally, it will be found that railway stocks are at present selling at lower prices than other stocks paying the same dividend rates. This is in spite of a somewhat greater margin of safety for dividends resulting from the extreme conservatism of the carriers.

Analysis will show that for the most part the dividends on the high-grade railroad stocks are earned about one and one-half to two times and that there are several instances in which dividend disbursements are being earned two and one-half times. Indeed, the complete record for both 1925 and 1926 shows that in each year the Class I carriers as a whole paid out to their stockholders but 49 per cent of their net income after interest and other fixed charges. Such margins of earning power over dividend payments are naturally to be taken into account in evaluating securities.

Value of Equities

Beyond this, however, is the recognition that must be given to other equities. The statistics show that at the end of 1926 as compared with the situation at the close of the fiscal year ended June 30, 1911, the value of the investment in railway physical property had increased 59 per cent, whereas the total capitalization had increased only 19 per cent. The fact that the funded debt had increased only 21 per cent shows that even if the proportion of funded debt to total capitalization is much too large the bondholder, nevertheless, supplied only a comparatively small proportion of the funds which made the great increase in investment possible. The amount of stock outstanding increased in the period in question only 15 per cent. It should be apparent therefore, that no inconsiderable share of the increase in investment in physical property which amounted to 59 per cent, as noted, must have come from the large proportion of net remaining after fixed charges that was put back in the property. This means that the better portion of the new money was supplied by the stockholder in the form of net income that was not made available to him in the form of dividends. The funds invested involuntarily by the stockholder in this manner now serve to protect his income. They also serve to shield him from the fact the railroad industry as such is relatively not prosperous.

Difficulty of Capitalizing Equities

In comparing the finances of the railroads with those of other companies proper consideration must be given to the general difficulty which regulated public utilities have in capitalizing equities of this kind. For an industrial company to issue a stock dividend or to carry through a stock split-up is a comparatively simple operation. It is quite the opposite for a railroad which is required to show cause to the Interstate Commerce Commission and to prove that the action is not contrary to the public interest. Nor is the difficulty simplified by the commission's generally conservative attitude toward such matters. That several of the carriers should have been able to sell issues of preferred or common stock during 1927 is remarkable evidence of the restoration of the credit position of the transportation industry. Considering the equities existing from the ploughed-in earnings of many years, it is quite unlikely

that the railroads should have found it possible to issue as much new stock as would have been found possible by industrial concerns having comparable earning power or comparable amounts of assets.

Dividend Changes in 1927

In addition to the foregoing factors the prices of railroad stocks were favorably affected by a large number of increases in dividend disbursements. In this respect, the year had much in common with the two years preceding it. As satisfactory as the improvement in the dividend record may have been in this time, however, there still remains much room for improvement. The following comparison of the dividend disbursements and the taxes paid by the Class I railroads since 1911 should prove of interest:

Table I—Comparison of Dividends and Taxes, 1911 to 1926

Year Ended June 30	Dividends	Proportion of Net Income Paid in Dividends	Taxes
1911	$397,068,724	81	$98,626,848
1912	339,964,855	85	109,445,407
1913	322,300,406	66	118,386,859
1914	376,098,785	108	135,572,579
1915	259,809,520	82	133,276,330
1916	281,936,371	47	145,517,034
Year Ended December 31			
1916	306,176,937	47	157,113,372
1917	320,395,779	53	213,920,095
1918	275,336,547	71	223,175,379
1919	278,516,908	62.5	232,601,396
1920	271,731,669	63	272,061,453
1921	298,511,328	95	275,875,990
1922	271,573,751	73	301,034,923
1923	296,127,048	53	331,915,459
1924	320,429,767	57	340,336,686
1925	342,020,885	49	358,516,046
1926	399,243,963	49	388,922,856

The foregoing figures need little comment. They show that the taxes paid by the railroads in five of the seven years from 1920 to 1926 exceeded the disbursements to the stockholders. One of the two exceptions is 1926, but it will, of course, be understood that were the dividends paid by one railroad to another deducted, the taxes would have substantially exceeded the dividends paid to the public even in that year. The dividend column does not include stock dividends. No doubt, many readers of the *Railway Age* will find reason for surprise in that the dividends paid in 1926 were approximately the same as those paid in 1911. Undoubtedly, when the record is complete it will be found that the 1927 dividend disbursements will have exceeded those of 1926 and, therefore, those of 1911.

A list of the more important dividend changes in 1927 follows:

Atchison, Topeka & Santa Fe.—The stock of this company is now regarded by investors as being on a 10 per cent annual dividend basis as a result of the extra dividends of 75 cents per share which were paid in addition to the regular dividends of $1.75 in each quarter of 1927. The regular dividends have been 1¾ per cent quarterly, or 7 per cent annually, since March, 1925.

Atlantic Coast Line.—Extra dividends of $1.50 each were paid on January 10 and July 11, so that total dividend disbursements in 1927 were 10 per cent. In 1926, an extra of $1 and one of $1.50 were paid, making with the regular 7 per cent disbursements, a total of $9.50. There will also be an extra of $1.50 paid on January 10, 1928.

Bangor & Aroostook.—This company, which for the past two years has been paying dividends of $3.00 or 6 per cent annually on its $50 par value common stock increased the quarterly dividend from 75 cents a share to 88 cents on October 1. This increased the annual rate to $3.50 or 7 per cent, although the 1927 payments totaled $3.13 per share, or 6¼ per cent.

Chesapeake & Ohio.—By paying a quarterly dividend of $2.50 per share on July 1, this company put its common stock on a regular 10 per cent annual dividend basis. The Chesapeake & Ohio paid 4 per cent annually on its common stock from 1917 to 1925, except in 1921 when only 2 per cent was paid. In April, 1926, the dividends were made 2 per cent quarterly and a special dividend of 4 per cent was paid, making total disbursements for the year 12 per cent. The 1927 payments will total 9 per cent.

Chicago, Indianapolis & Louisville.—Extra payments, each of one per cent, on January 10 and July 11 gave stockholders 7 per cent dividends in 1927 as compared with 6 per cent in 1926 when a single extra of 1 per cent was paid.

Chicago, Rock Island & Pacific.—The first dividend on the common stock since the reorganization in 1916 was paid on March 31 in the form of a quarterly disbursement of 1¼ per cent, which put the stock on a 5 per cent annual dividend basis. It was announced at the time that this was made possible by earnings in 1926 which, after allowance for preferred dividends, equalled about $10.62 per share on the common, exclusive of $3.31 per share, representing profits on the sale of Cotton Belt stock.

Cincinnati Northern.—Nearly all of the stock of this company is owned by the Big Four. Dividends in 1927 totaled 50 per cent, including 10 per cent regular and an extra of 40 per cent paid December 30. Disbursements in 1925 and 1926 each totaled 10 per cent.

Delaware, Lackawanna & Western.—In addition to the regular $6 regular and $1 extra dividends, amounting to 14 per cent on the company's $50 par value stock, the stockholders received in 1927 also ownership of an entirely new company. This was the Lackawanna Securities Company, organized for the purpose of holding certain securities hitherto held in the Lackawanna treasury and the stock of which was distributed to the Lackawanna stockholders in the ratio of one share of new Securities Company stock to each two shares of railroad stock. The proposal was to turn over to the new company a total of $92,006,000 of bonds but as a result of Interstate Commerce Commission disapproval, the railroad found it possible to turn over only $58,500,000 bonds of the Glen Alden Coal Company.

Gulf, Mobile & Northern.—On January 3, 1928, holders of the 6 per cent cumulative preferred stock will receive a dividend of 2½ per cent, of which one per cent is to apply to arrears, which after this payment will amount to 16½ per cent.

Hocking Valley.—Following the example of its parent company—the Chesapeake & Ohio which owns 80 per cent of the outstanding stock,—the Hocking Valley put its stock on a 10 per cent annual dividend basis, effective with the June 30 payment.

Lehigh Valley Omits Extra

Lehigh Valley.—Stockholders received a total of $3.50 per share, or 7 per cent, in dividends in 1927, the same as in each of the years from 1920 to 1925. In 1926, an extra of 3 per cent was paid, but the extra was omitted in 1927 as a result of a decline in earnings due to the lessened movement of anthracite coal.

Louisville, Henderson & St. Louis.—This company declared a 2½ per cent semi-annual dividend on its common stock payable February 15. This stock has been paying dividends only since September, 1925, when an initial dividend of 2 per cent was paid. Payments in 1926 totaled 4 per cent. Nearly all of the issue is owned by the Louisville & Nashville.

Maine Central.—This company which restored the dividends on its common stock in 1926 with two payments of one per cent each, put its dividends on a one per cent quarterly basis effective with the July 1, 1927 payment. From 1912 to 1920, the Maine Central paid 6 per cent annually on this issue.

Michigan Central.—The New York Central, which owns over 99 per cent of the outstanding stock of this company, received dividends on this stock in 1927 totaling 87½ per cent. This total included a regular semi-annual dividend of 17½ per cent paid in January, a regular semi-annual dividend of 20 per cent paid in July and an extra dividend of 50 per cent paid on December 30. The stock outstanding totals $18,736,400. Dividend disbursements totaled 20 per cent in 1924 and 1925, and 35 per cent in 1926.

Missouri-Kansas-Texas.—The dividends on the preferred stock become cumulative after January 1, 1928 at the rate of 7 per cent. The rate has been 6 per cent since May, 1926. In December, 1927 directors declared a dividend of 1 per cent, payable December 31, explaining that the purpose was to adjust the quar-

terly dividend dates to run hereafter from January 1, 1928. The 1927 payments on this issue, therefore, were 7 per cent.

New York Central Pays 8 Per Cent

New York Central.—Increasing prosperity for the parent company and its subsidiaries made possible an increase in the dividend rate from 7 to 8 per cent annually, effective with the August 1 quarterly payment. Inasmuch as the increased rate was in effect for only part of the year, the 1927 disbursements totaled $7.50 per share. In addition to the increased dividend stockholders also had the right to subscribe to new stock at par on the basis of one new share for each 10 held.

New York, Chicago & St. Louis.—The regular rate on this company's common stock which had been 11 per cent from July, 1926, was with the October, 1927, quarterly payment reduced to 6 per cent. This resulted from the distribution to Nickel Plate stockholders of stock of the new Chesapeake Corporation. The new company owns 600,000 shares of the Chesapeake & Ohio, the majority of which was acquired from a subsidiary of the Nickel Plate. The distribution of its shares was on the basis of 1.7 shares of Chesapeake Corporation for each share of Nickel Plate common. The new company paid an initial quarterly dividend of 75 cents on October 1.

New York, New Haven & Hartford.—This company on January 2, 1928 will pay its first dividend since 1913 in the form of an initial regular 1¾ per cent quarterly dividend on the new 7 per cent cumulative preferred stock.

Norfolk & Western.—The dividends were increased to an annual rate of 8 per cent with the declaration of a quarterly dividend of 2 per cent last January, payable March 19. The regular rate previously was 7 per cent but extras of one per cent were paid in 1916 and 1917 and from 1922 to 1925. In 1926 an extra of 3 per cent was paid, making total disbursements for the year 10 per cent. There was an extra of 2 per cent paid on December 19, 1927, so that the 1927 payments also aggregated 10 per cent.

Pere Marquette.—This company pays $1.50 per share quarterly on its common stock. Payment of an extra of $2 a share on April 1 increased total dividend disbursements to 8 per cent. The Pere Marquette paid 4 per cent dividends on its common stock from 1923 to 1925. The rate was changed to 5 per cent in 1926 and with an extra of 2 per cent, total payments in that year were 7½ per cent. The company also proposed to pay a 20 per cent stock dividend on October 1, amounting to $9,009,200, but permission to do so was refused by the Interstate Commerce Commission.

Pittsburgh & Lake Erie.—Directors of this company declared a 20 per cent stock dividend payable to stock of record December 1. The company pays regular dividends of 10 per cent and in 1926 also paid extras of 10 per cent. A majority of the stock is owned by the New York Central.

St. Louis-San Francisco.—This company paid extra dividends of ¼ per cent on April 1, July 1, and October 1 and will also pay an extra of the same amount on January 3, 1928. The directors announced, when the first of these extras was declared, that it was made possible by the establishment of dividends on the 183,333 shares of Rock Island stock held by the company. "It was the judgment of the directors," their announcement said, "that this income, amounting to $916,665 per annum, should be shared by the company with its stockholders." The regular dividend on the common stock has been 1¾ per cent quarterly since October, 1925.

Southern Pays 8 Per Cent

Southern.—This company paid an initial dividend on its common stock of 1¼ per cent quarterly, or at the annual rate of 5 per cent, in May, 1924. The prosperity of the company permitted an increase in the annual dividend disbursements to 7 per cent, effective with the February 1, 1926 quarterly disbursement. On February 1, 1928, stockholders will receive a quarterly dividend of 2 per cent, which puts the issue on an 8 per cent annual basis.

Toronto, Hamilton & Buffalo.—An extra dividend of one per cent paid December 31 made total dividend disbursements for the year 7 per cent. The company paid 6 per cent in 1921, 1922 and 1923 but none in 1924. In 1925 it paid 6 per cent regular and on December 31, 1925, it issued a stock dividend of 20 per cent. The 6 per cent dividend was continued on the increased capitalization. The stock of the company is owned by the New York Central, the Michigan Central, the Canada Southern (a Michigan Central subsidiary) and the Canadian Pacific.

Wabash.—Dividends on the 5 per cent Preferred "B" stock were inaugurated with a payment of 5 per cent on April 1. There is only a small amount of this issue outstanding.

Western Pacific.—Decision on the part of the Western Pacific Railroad to devote its net income to improvement of its property required the directors of the Western Pacific Railroad Corporation, which is a holding company to decide on November 1 that no further dividends would be paid for the present. The Corporation had paid 6 per cent annually on its preferred stock since July, 1920, payments being made quarterly. Disbursements in 1927 totaled $3.00, representing the first two quarterly installments.

Railway Security Issues in 1927

The amount of new security issues sold by the railroads during 1927 totaled over $900,000,000 and was about double the total for 1926. Whereas financing by railroads in 1926 was 7.94 per cent of all new financing, in 1927 it increased to about 13 per cent. The total amount of railroad securities sold to the public, however, still was not as great as in 1924, in which year the total was nearly a billion dollars and 23.46 per cent of the year's total of all new financing.

The favorable money market conditions of the year were utilized by the carriers to a considerable extent to refund their bonded indebtedness at lower rates of interest. The amount of bonds sold totaled over $600,000,000. This was about two and one-half times the amount of railroad bonds sold in 1926, and approximately the same amount as were sold in 1924.

The favorable money market conditions were evidenced in several ways. One was the gradual, although not particularly substantial, rise in the price of railway bonds. The *Railway Age* average of the price of 20 representative railway bonds is now about five points higher than it was at the beginning of the year. On the spectacular side was the ready absorption of the Missouri Pacific's isue of $95,000,000 first and refunding Series F bonds, maturing in 1977. The rate of interest on the issue was 5 per cent. The bonds were sold to the public at par and, as was rather typical of the better part of the 1927 new financing, over two-thirds of the proceeds were used for refunding. This was said to be the largest piece of railroad financing on record with the exception of the $230,000,000 6½ per cent Burlington refunding issue of the Great Northern and Northern Pacific in 1921.

Refunding of Government Loans

Noteworthy with respect to the refunding operations of the year was the clearing up of most of the remaining indebtedness to the government which was incurred as a result of federal control and the borrowings from the guaranty fund immediately thereafter. In its financing operations above mentioned the Missouri Pacific paid off $8,000,000 of government notes. The Boston & Maine sold in August an issue of $30,942,000 5 per cent first mortgage bonds the proceeds of which were largely used for this purpose. The New York, New Haven & Hartford assisted in improving its credit standing considerably by selling to its stockholders at par $49,036,700 7 per cent cumulative preferred stock followed later by the sale of $31,000,000 4½ per cent first and refunding mortgage bonds, series of 1927, offered to the public at 91¼. The proceeds of the sale of preferred stock and bonds were devoted chiefly to the retirement of $70,030,000 indebtedness to the United States Treasury. The company's total indebtedness to the government totaled $87,030,000. The other $17,-

(*Continued on page* 61)

Table II—Railroad Securities Issued in 1927—Stock

Road	Issue	Amount	Terms
Atlantic Coast Line Co.	Capital	$2,940,000	Sold at par ($50) to assist company to purchase 3,718,200 common stock of Atlantic Coast Line R. R. Co.
Atchison, Topeka & Santa Fe	Common	9,296,400	To be sold at par to stockholders of record on January 27, 1928 in ratio of 4 per cent of holdings.
Baltimore & Ohio	Common	63,242,500	Offered at $107.50 per share to preferred and common holders of record June 20, 1927 to extent of 30 per cent of holdings.
Bangor & Aroostook	Common	1,468,000	Offered at $60 (par $50) to common and preferred holders of record July 19 in ratio of 2 new shares for each 5 preferred held and 1 new share for each 5 common shares held.
Canadian Pacific	Ordinary	32,500,00	Offered at $150 per share to holders of record August 19, 1927 in ratio of one new share for each 8 held.
Canadian Pacific	Ordinary	5,000,000	Offered at $150 per share to officers and employees.
Chesapeake Corp.	Common	900,000 sh.	Shares of no par value distributed to common stockholders of New York, Chicago & St. Louis.
Delaware, Lackawanna & Western	Capital	130,500	For exchange share for share for capital stock of Lackawanna & Montrose.
Erie	Common	39,254,200	Authorized for purposes of exchange with $19,627,100 convertible general mortgage bonds, Series D, in ratio of 2 shares of stock for each $100 par value of bonds.
Fairport, Painesville & Eastern		250,000	
Glasgow	Common	100,000	Paid as 100 per cent stock dividend to holders of record April 1, 1927. Company is leased to Louisville & Nashville.
Lake Superior & Ishpeming	Common	2,856,000	Issued as a stock dividend in ratio of 2 shares for each share held.
Missouri-Illinois	Capital	750,000	Issued as a stock dividend.
New York Central	Common	38,325,000	Offered at $100 per share to stockholders of record August 10, 1927 on basis of 10 per cent of holdings.
New York, New Haven & Hartford	7% Cum. Pref.	49,036,700	Offered at $100 per share to stockholders of record August 29, 1927 in ratio of one share for each 4 held and to holders of convertible debenture bonds in ratio of one share for each $400 of bonds.
Old Colony	Capital	891,700	Sold at auction, proceeds used to reimburse New Haven for advances.
Pere Marquette	Common	9,009,200	Permission to issue as stock dividend of 20 per cent, payable October 1, refused by I. C. C.
Pittsburgh & Lake Erie	Common	7,197,100	Issued as 20 per cent stock dividend to stock of record December 1, 1927.
St. Louis-San Francisco	Common	15,096,200	Sold at par ($100) to holders of record April 9 in ratio of 3 shares for each 10 shares held.

Bonds

Date	Issue	Maturity	Amount	Interest rate	Sold to bankers: Price	Sold to bankers: Cost Per Cent	Offered to public: Price	Offered to public: Yield	Offered by
January									
	Georgia & Florida, 1st Mtge., Series A	1946	$4,136,000	6	87½	...	98	6.17	Hayden Stone & Co., Harrison, Smith & Co., West & Co., etc.
	Gulf, Mobile & Northern, 1st Mtge., Series C	1950	3,000,000	5	97.25	5.2	99¾	....	Kuhn, Loeb & Co.
	Indiana Harbor Belt, Guar. Gen. Mtge.	1957	5,000,000	4½	94	4.88	96	4.75	J. P. Morgan & Co., First National Bank, National City Co. and First Trust & Savings Co., Chicago.
	Seaboard Air Line, Ref. Mtge. (1909)	1959	5,000,000	4	....	...	....	....	Hemphill, Noyes & Co.
	Sumpter Valley, 1st Mtge. Series	1929-42	650,000	6	91.5	7.1	....	6.15	Lumbermen's Trust Co.
February									
	Chicago & North Western, 1st & Ref. Mtge.	2037	20,572,000	4½	92½	4.868	95	4.74	Kuhn, Loeb & Co., National City Bank.
	International Rys. of Central Amer., 1st lien & Ref. Mtge.	1947	6,000,000	6½	....	...	92	7.25	J. Henry Shroder Banking Corp., Blyth, Witter & Co., White, Weld & Co.
	Missouri Pacific, 1st & Ref. Mtge., Series F.	1977	95,000,000	5	97¼	5.154	Par	....	Kuhn, Loeb & Co.
	Norwich & Worcester, 1st Mtge.	1947	1,800,000	4½	97.78	4.672	98.875	4.60	Kidder, Peabody & Co., R. L. Day & Co., Boston.
	Seaboard Air Line, 1st & Cons. Mtge., Series A	1945	5,000,000	6	96½	6.323	98¾	6.10	Dillon, Read & Co., Ladenburg, Thalmann & Co.
	Seaboard-All Florida, Guar. 1st Mtge., Series B	1935	2,000,000	6	95½	6.703	97¾	6.30	Dillon, Read & Co., Ladenburg, Thalmann & Co.
March									
	Chicago, Burlington & Quincy, 1st & Ref. Mtge., Series B	1977	30,000,000	4½	94	4.82	97	4.65	J. P. Morgan & Co., First National Bank, National City Co.
	Northern Central, Gen. & Ref. Mtge., Series A (1924)	1974	5,231,000	4½	94¼	4.81	96½	4.70	Kuhn, Loeb & Co.
	Pennsylvania, Ohio & Detroit, Guar. 1st & Ref. Mtge., Series A	1977	22,000,000	4½	92½	4.9	95	4.76	Kuhn, Loeb & Co.
	Texas & Pacific, Gen. & Ref. Mtge, Series B.	1977	16,000,000	5	97	5.168	99½	....	Kuhn, Loeb & Co., etc.
April									
	Atlantic Coast Line, Gen. Unified Mtge., 50-yr., Series A	1964	8,809,000	4½	94½	4.82	98	4.60	J. P. Morgan & Co.
	Illinois Central & Chicago, St. Louis & New Orleans, Jt. 1st Ref. Mtge., Series C	1963	17,350,000	4½	95	4.795	97½	4.64	Kuhn, Loeb & Co., etc.
May									
	Boston, Revere Beach & Lynn, 1st Mtge.	1947	1,000,000	4¾	....	...	Par	....	Harris, Forbes & Co., Jackson & Curtis, N. Y.; Harris Trust & Savings Bank, Chicago, etc.
	Chesapeake Corp., Conv. Coll. tr.	1947	48,000,000	5	....	...	95	5.50	J. P. Morgan & Co., First National Bank, Guaranty Co., National City Co., Lee, Higginson & Co.
	Erie, Ref. & Imp. Mtge.	1967	50,000,000	5	91½	5.53	94½	5.30	J. P. Morgan & Co., First National Bank and National City Co.
	Union Pacific, 40-yr. bonds	1967	26,835,000	4½	94¾	4.796	97¼	4.65	Kuhn, Loeb & Co., etc.
June									
	Buffalo, Rochester & Pittsburgh, Cons. Mtge.	1957	3,536,000	4½	94	4.883	97	4.70	Brown Bros. & Co., Marshall Field, Glore, Ward & Co., Ingraham & Du Bosque, Biddle & Henry, Phila.
	Canadian National, 30-yr. Guar. bonds	1957	65,000,000	4½	....	...	98½	4.60	Blair & Co., Inc., Chase Securities Corp., Equitable Trust Co., First National Corp., Boston.
	Chicago, Indianapolis & Louisville, 1st & Gen. Mtge., Series A	1966	650,000	5	100½	4.971	103	4.85	Harris, Forbes & Co., Potter & Co.
	Cuba Northern, 1st Mtge., Series of 1942	1942	20,000,000	5½	....	...	98½	5.65	National City Co., Lee, Higginson & Co., and Cassatt & Co., etc.
	Lehigh & New England, Gen. Mtge., Series B	1954	750,000	5	102	4.867	103	....	Drexel & Co., Phila.
	Rock Island-Frisco Terminal Ry., Guar. 1st Mtge.	1957	3,390,000	4½	94	4.883	96½	4.72	Speyer & Co., J. & W. Seligman & Co. and Guaranty Co. of N. Y.
	Southern Pacific, Oregon Lines, 1st Mtge., Series A	1977	20,000,000	4½	98	4.6	100½	....	Kuhn, Loeb & Co., etc.
	Fairport, Painesville & Eastern, 1st Mtge.	1957	2,000,000	6	94	6.455	....	....	Cleveland Trust Co.
	Western Maryland, 1st & Ref. Mtge., Series A	1977	12,000,000	5½	96½	5.713	99½	....	Kuhn, Loeb & Co., Speyer & Co., National City Co.

Bonds—Continued

Date	Issue	Maturity	Amount	Interest rate	Sold to bankers: Price	Sold to bankers: Cost Per Cent	Offered to public: Price	Offered to public: Yield	Offered by
July									
	Alabama, Tennessee & Northern, prior lien (1918)	1948	1,000,000	6	91½	6.76	98½	6.12	F. J. Lisman & Co.
	Minneapolis & St. Louis, 1st Mtge. extended.	1932	650,000	6	Comm. 2½%	...	101½	5.65	F. J. Lisman & Co., etc.
	Northern of New Jersey, Gen. Mtge. (1900).	2000	707,000	4½	90½	4.99	90¾	....	Drexel & Co., Phila.
August									
	Boston & Maine, 1st Mtge., Series AC.....	1967	30,942,000	5	90.25	5.614	93¼	5.41	Kidder, Peabody & Co., etc.
	Chicago, Rock Island & Pacific, Secured bonds, Series A.....	1952	40,000,000	4½	92½	5.03	95	4.85	Speyer & Co., National City Co., J. & W. Seligman & Co.
	Louisiana & Northwest, 1st Mtge. (1905)...	1935	450,000	5	....	...	80	8.50	F. J. Lisman & Co., etc.
	New York, New Haven & Hartford, Participation certs. in coll. note.....	1930	17,000,000	6	....	...	....	4.50, 6.00	Halsey, Stuart & Co., Inc., Edward Lowber, Stokes & Co., Hambleton & Co.
September									
	Hoboken Railroad & Terminal, 1st lien Sinking fund	1947	1,250,000	6	....	...	99	6.10	P. W. Chapman & Co., Steneck Trust Co., Hoboken.
	Mobile & Ohio, Ref. & Imp. Mtge.....	1977	13,879,000	4½	92½	4.90	95	4.75	J. P. Morgan & Co., First National Bank, National City Co.
October									
	Dansville & Mount Morris, 1st Mtge.....	1931	Block	5	....	...	96½	6	Howard F. McCandless & Co., San Francisco.
	Great Northern, Gen. Mtge., Series E.....	1977	20,000,000	4½	97	4.655	99	4.55	J. P. Morgan & Co., First National Bank, National City Co.
	Morris & Essex, Guar. 1st Ref. Mtge.....	2000	9,871,000	3½	83½	4.23	85	4.15	J. P. Morgan & Co.
	Western Pacific, 1st Mtge., Series A (1916).	1946	2,678,500	5	99.5	5.042	Par	5	Clark, Dodge & Co., Mabon & Co.
	Tennessee Central, 1st Mtge., Series B.....	....	410,000	6	96½	6.3	....	....	
November									
	Canadian National, guar. 30-yr. bonds.....	1957	1,250,000	4½	.....	...	....	4.45	A. E. Ames & Co., Ltd., etc.
	Norfolk Southern, 1st & Ref. Mtge., 50-yr. (1911)	1961	1,466,000	5	95.5	5.29	96½	5.22	Clark, Dodge & Co., etc., Atlantic-Merrill Oldham Corp.
	Kansas City, Shreveport & Gulf, 1st Mtge. bonds, extended	....	150,000	6	....	...	....	....	
	Pittsburgh, Cincinnati, Chicago & St. Louis, Gen. Mtge., Series A and B (1920, 1925)..	1970-75	1,500,000	5	....	...	....	4.25	Kountze Bros., Stone & Webster and Bledgett, Inc., Canadian Bank of Commerce.
December									
	Missouri-Kansas-Texas, pr. lien Mtge., Series D	1978	13,600,000	4½	97¼	...	99¾	....	Kuhn, Loeb & Co., Ladenburg, Thalmann & Co., National City Co., J. & W. Seligman & Co., Hallgarten & Co.
	New York, New Haven & Hartford 1st & ref. Mtge.	1967	$31,000,000	4½	89¼	....	91¼	5	J. P. Morgan & Co., First National Bank, National City Co., Kidder, Peabody & Co., and Lee, Higginson & Co.
	Central of New Jersey, Gen. Mtge.....	1987	5,000,000	4	96½	4.16	98½	..	J. P. Morgan & Co., First National Bank and National City Co.
	Lehigh Valley, Gen. Cons Mtge.....	2003	12,686,000	4	90¾	....	92¾	..	Drexel & Co., First National Bank.
	New Orleans, Texas & Mexico, 1st Mtge., Series D	1956	5,900,000	4½	....	....	98	4.63	Kuhn, Loeb & Co.
	International-Great Northern, 1st Mtge., Series C	1956	5,500,000	5	....	....	101¾	4.89	Kuhn, Loeb & Co.

Equipment Trust Certificates

Issue	Maturity	Amount	Interest rate	Sold to bankers: Price	Sold to bankers: Cost Per Cent	Offered to public: Price	Offered to public: Yield	Offered by
Baltimore & Ohio, Series E.....	1930-42	9,750,000	4½	98.69	4.685	....	4.60	Bankers Trust Co., Brown Bros. & Co., Kissel, Kinnicutt & Co., Evans, Stillman & Co., Harrison, Smith & Co.
Canadian National, Series J.....	1928-42	15,000,000	4½	....	...	....	4.50-4.70	Dillon, Read & Co., etc.
Central of New Jersey.....	1928-41	1,064,000	4½	100.653	4.393	....	4-4.35	J. G. White & Co., Inc., etc.
Chicago & North Western, 1927, Series R..	1928-42	1,950,000	4½	Par	...	....	4-4.25	Old Colony Corp., etc.
Chicago & North Western, 1927, Series S...	1928-42	2,610,000	4½	101.32	4.29	....	4, 4.10, 4.20	Salomon Bros. & Hutzler.
Chicago, Rock Island & Pacific, Series O....	1930-42	8,515,000	4½	98.857	4.66	....	4.50-4.55	Bankers Trust Co., etc.
Chicago, St. Paul, Minn. & Omaha, 1917, Series D	1928-37	830,000	4¾	101.52	4.43	....	4.10-4.35	Halsey, Stuart & Co., Chicago.
Cincinnati, Hamilton & Dayton, Series A....	1927-37	450,000	5, 5½, 6	....	...	....	5 to 6	Halsey, Stuart & Co., Chicago, etc.
Denver & Rio Grande Western, Series C...	1928-42	1,575,000	4½	98.3017	4.77	....	4.50, 4.60, 4.65	Guaranty Co. of N. Y. and Alex. Brown & Sons.
Erie, Series NN.....	1930-42	6,422,000	4½	98.68	4.69	....	4.60	Drexel & Co., Phila.
Illinois Central, Series O.....	1928-42	8,460,000	4½	100.171	4.473	....	4.20-4.40	Guaranty Co., N. Y.; Graham Parsons & Co., Alex. Brown & Sons, Shawmut Corp., Boston.
International-Great Northern, Series B.....	1928-42	1,755,000	4½	98.533	4.733	....	4.50-4.60	Freeman & Co., J. & W. Seligman & Co., Hallgarten & Co.
Lehigh & New England, Series F.....	1928-42	750,000	4½	99	4.658	....	4-4.35	Drexel & Co., Phila.
Long Island Series I.....	1928-42	3,765,000	4½	99.391	4.596	....	....	Mellon National Bank, Pittsburgh.
New Orleans, Texas & Mexico, Series C...	1928-42	930,000	4½	98.666	4.71	....	4.50-4.60	Freeman & Co., J. & W. Seligman & Co., Hallgarten & Co.
New York, New Haven & Hartford, Series 1927, No. 2.....	1928-42	4,500,000	4½	101.02	4.337	....	4-4.30	Halsey, Stuart & Co., Chicago.
Norfolk Southern	1928-37	300,000	4½	97.18	5.11	....	4.65, 4.75, 4.80	Mercantile Trust & Deposit Co. of Baltimore, and Strother, Brogden & Co., Baltimore.
Pere Marquette, Series A.....	1928-42	2,550,000	4½	99.71	4.546	....	....	Mellon National Bank, Pittsburgh.
Seaboard Air Line, Series AA, pr. lien.....	1928-37	850,000	4½	97.6	4.895	....	....	Dillon, Read & Co.
Southern Pacific, Series J.....	1932-42	5,786,000	4½	99.52	4.561	Par	....	Salomon Bros. & Hutzler, Mellon National Bank, Pittsburgh.
Texas & Pacific, Series JJ.....	1928-42	1,425,000	4½	98.544	4.731	....	4.50-4.60	Freeman & Co., J. & W. Seligman & Co., Hallgarten & Co.
Wabash, Series G.....	1928-42	2,625,000	4½	98.555	4.729	....	4.50-4.60	Freeman & Co., J. & W. Seligman & Co., Hallgarten & Co.
Western Maryland, Series E.....	1927-41	1,260,000	4½	97.532	4.906	....	4-4.70	Brown Bros. & Co., and Alex. Brown & Sons, Baltimore.

Table III—Railway Securities Sold to Public in 1916 and 1920 to 1927

	Bonds	Notes	Stock	Total R. R. financing	Total all financing	Per cent R. R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.90
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.12
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.64
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.22
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.04
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.46
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.63
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.94
*1927	613,253,000	89,184,000	210,596,000	913,035,000	6,988,805,000	13.06

* 11 Months 1927.

(*Continued from page* 58)

000,000 was in the form of a 6 per cent collateral note which was sold by Secretary Mellon to bankers. The interest rate has since been changed to 5 per cent on condition that the note will not be called before March, 1929.

Competitive Bidding Apparently Successful

A feature of the railway finances of 1926 was the effect of the Interstate Commerce Commission's insistence on competitive bidding for equipment trust certificates. The number of issues of this kind in 1927 was not especially large, as a result of the lessened purchases of railway equipment. All of the issues were apparently sold without difficulty, bids for all issues coming from the bankers in good number and at satisfactory prices. Many observers still believe that similarly satisfactory results will not be secured when money conditions are less favorable.

Financing with Stock

A feature of railway finances in 1927 was, of course, the large amount of new issues of common or preferred stocks. The total for the year was $210,000,000, which was no less than five times as much as in 1926. This total does not include conversions from bonds into stock. Even the Erie, which has never paid a dividend on its common stock, substantially increased the amount of that issue outstanding in 1927 by the exchange of convertible bonds. The roads that sold stock during the year included the Baltimore & Ohio, $63,242,500; the New York Central, $38,325,000; the New York, New Haven & Hartford, $49,036,700; the Canadian Pacific, $37,500,000; the Atchison, Topeka & Santa Fe, $9,296,400; the St. Louis-San Francisco, $15,096,200; and the Bangor & Aroostook, $1,468,000. The increase in Erie common outstanding as a result of the conversions referred to above amounted to $39,000,000. The Baltimore & Ohio sold its stock at $107.50; the Canadian Pacific at $150, and the Bangor & Aroostook at $60 ($50 par value). The other issues were sold at par and in all instances present stockholders benefited at least to some extent from the value of their subscription rights.

In some of the instances the proceeds from the sale of the stock represented new capital, but in others, such notably as the Atchison, Topeka & Santa Fe; the New York, New Haven & Hartford; the Baltimore & Ohio in part and the Erie it represented the substitution of certificates of ownership in place of debt.

There were two important instances of stock dividends. The Pere Marquette proposed to issue a stock dividend of 20 per cent, amounting to $9,009,200, in common stock but was refused permission to do so by the Interstate Commerce Commission. The Pittsburgh & Lake Erie, the majority of the stock of which is owned by the New York Central, has received I. C. C. approval for the issue of a stock dividend also of 20 per cent, which in its case will amount to $7,197,100.

Railroads in the Hands of Receivers

On December 31, 1927, there were in the hands of receivers but 37 railroad properties operating a total of 16,622 miles of line. The number of roads in receivership is 5 less than at the close of 1926. The mileage also is less. It includes, however, the 11,025 miles of the Chicago, Milwaukee & St. Paul. Had the reorganization of that company been completed as was expected, the mileage of roads in the hands of receivers would have been the smallest since 1911.

Table IV—Receiverships Established in 1927

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
Bridgton & Saco River	21	$170,000	$102,250
Castleman Valley	14	.....	.....
Central Vermont	493	33,480,724	3,000,000
Missouri & North Arkansas	365	5,000,000	3,000,000
Nevada County Narrow Gauge	21	83,500	250,200
Winifrede Railroad	10	.....	150,000
Six companies	924	$38,734,224	$6,502,450

During the year only six roads were taken over by the courts. This number compared with only two in 1926, but otherwise, there were only six years since 1876 in which fewer roads went into receivership. Two of the four roads were Class I carriers and both suffered receivership as a result of floods. One was the Missouri & North Arkansas and the other was the Central Vermont. It is not without interest that the latter carrier was also involved in receivership proceedings last year. This resulted from the petition into receivership then of the Southern New England into which the Central Vermont had put large sums of money for the purpose of gaining an entrance into Providence, R. I., but which had never been carried to completion or put into operation.

Table V—Foreclosure Sales in 1927

Road	Mileage	Funded debt outstanding	Capital stock outstanding
Atlantic & Western	24	$332,000	$332,000
Cape Girardeau Northern	12	1,500,000	110,000
Frankfort & Cincinnati	41	None	40,000
Macon & Birmingham	0	.....	.....
Wabash, Chester & Western	65	690,000	1,250,000
Five companies	142	$2,522,000	$1,732,000

The Central Vermont was a subsidiary of the Grand Trunk and was acquired by the Canadian National when the latter system took over the Grand Trunk lines. The Central Vermont has failed for some years to meet its fixed charges, and a large proportion of its liabilities include indebtedness to the Canadian National for advances, including the large sums of money advanced by the old Grand Trunk to assist in the building of the Southern New England.

The list of roads in the hands of receivers shows sev-

eral important changes from the list as of December 31, 1926. During the year 1927 there were removed from receivership the Atlantic, Birmingham & Atlantic; the Denver & Salt Lake; the Gainesville Midland; the Georgia & Florida; the Toledo, Peoria & Western, etc., all of which had been sold at foreclosure in 1926 but the reorganization of which had not been completed in time to remove them from the list of roads in receivership at the end of the year. It was expected that the reorganization of the St. Paul, which was sold at foreclosure on November 22, 1926, would also have been completed so as to remove it from this year's receivership list.

Table VI—Railroad Mileage in the Hands of Receivers

(Figures to 1925, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1925. Figures for 1926 and 1927 Compiled by *Railway Age*)

Year ended	Miles of road operated by receivers at close of year	Net change during the year in miles of road operated	Number of roads in charge of receivers at close of year
June 30, 1894	40,819	.....	192
1895	37,856	—2,963	169
1896	30,476	—7,380	151
1897	18,862	—11,614	128
1898	12,745	—6,117	94
1899	9,853	—2,892	71
1900	4,178	—5,675	52
1901	2,497	—1,681	45
1902	1,475	—1,022	27
1903	1,185	—290	27
1904	1,323	+138	28
1905	796	—527	26
1906	3,971	+3,175	34
1907	3,926	—45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	—5,273	39
1911	4,593	—664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,535	+7,130	94
Dec. 31, 1916	34,804	—*2,550	80
1917	17,376	—17,428	82
1918	19,208	+1,832	74
1919	16,590	—2,618	65
1920	16,290	—300	61
1921	13,512	—2,778	68
1922	15,259	+1,747	64
1923	12,623	—2,310	64
1924	8,105	—4,518	61
1925	18,687	+10,582	53
1926	17,711	—976	42
1927	16,622	—1,089	37

* Represents decrease for six months.

Table VIII—Summary of Railroad Receiverships and Foreclosure Sales, 1876 to 1927

Year	Roads Placed in Receivership: Number of roads	Miles	Bonds and stocks	Summary of Foreclosure Sales: Number of roads	Miles	Bonds and stocks
1876...	42	6,662	$467,000,000	30	3,840	$217,848,000
1877...	38	3,637	220,294,000	54	3,875	198,984,000
1878...	27	2,320	92,385,000	48	3,906	311,631,000
1879...	12	1,102	39,367,000	65	4,909	243,288,000
1880...	13	885	140,265,000	31	3,775	263,882,000
1881...	5	110	3,742,000	29	2,617	137,923,000
1882...	12	912	39,074,000	16	867	65,426,000
1883...	11	1,990	108,470,000	18	1,354	47,100,000
1884...	37	11,038	714,755,000	15	710	23,504,000
1885...	44	8,836	385,460,000	22	3,156	278,394,000
1886...	13	1,799	70,346,000	45	7,687	374,109,000
1887...	9	1,046	90,318,000	31	5,478	328,181,000
1888...	22	3,270	186,814,000	19	1,596	64,555,000
1889...	22	3,803	99,664,000	25	2,930	137,815,000
1890...	26	2,963	105,007,000	29	3,825	182,495,000
1891...	26	2,159	84,479,000	21	3,223	169,069,000
1892...	36	10,508	357,692,000	28	1,922	95,898,000
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000
1894...	38	7,025	395,791,000	42	5,643	318,999,000
1895...	31	4,089	369,075,000	52	12,831	761,791,000
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000
1897...	18	1,537	92,909,000	42	6,675	517,680,000
1898...	18	2,069	138,701,000	47	6,054	252,910,000
1899...	10	1,019	52,285,000	32	4,294	267,534,000
1900...	16	1,165	78,234,000	24	3,477	190,374,000
1901...	4	73	1,627,000	17	1,139	85,808,000
1902...	5	278	5,835,000	20	693	39,788,000
1903...	9	229	18,823,000	13	555	15,885,000
1904...	8	744	36,069,000	13	524	28,266,000
1905...	10	3,593	176,321,000	6	679	20,307,000
1906...	6	204	55,042,000	8	262	10,400,000
1907...	7	317	13,585,000	6	114	13,777,000
1908...	24	8,009	596,359,000	3	138	2,547,000
1909...	5	859	78,095,000	12	2,629	250,033,000
1910...	7	735	51,427,500	17	1,100	93,660,109
1911...	5	2,606	210,606,882	13	1,386	40,741,543
1912...	13	3,784	182,112,497	12	661	25,910,990
1913...	17	9,020	477,780,820	6	1,159	86,163,850
1914...	22	4,222	199,571,446	9	1,470	83,189,500
1915...	12	20,143	1,070,808,628	11	3,914	285,258,782
1916...	9	4,439	208,159,689	26	8,355	703,444,855
1917...	19	2,486	61,169,962	20	10,963	557,846,348
1918...	8	3,519	242,090,800	11	763	24,735,187
1919...	7	244	11,886,779	8	459	15,479,587
1920...	10	541	21,620,150	7	380	7,676,200
1921...	14	1,744	63,872,113	11	4,173	306,123,942
1922...	12	4,330	329,114,860	15	6,151	299,491,646
1923...	10	2,218	87,913,581	8	637	14,622,900
1924...	11	920	30,223,372	14	3,992	269,251,082
1925...	5	11,130	679,679,580	6	638	9,965,000
1926...	2	40	.....	12	12,852	626,662,708
1927...	6	924	45,236,674	5	142	4,254,000

Table VII—Railroads in the Hands of Receivers on December 31, 1927

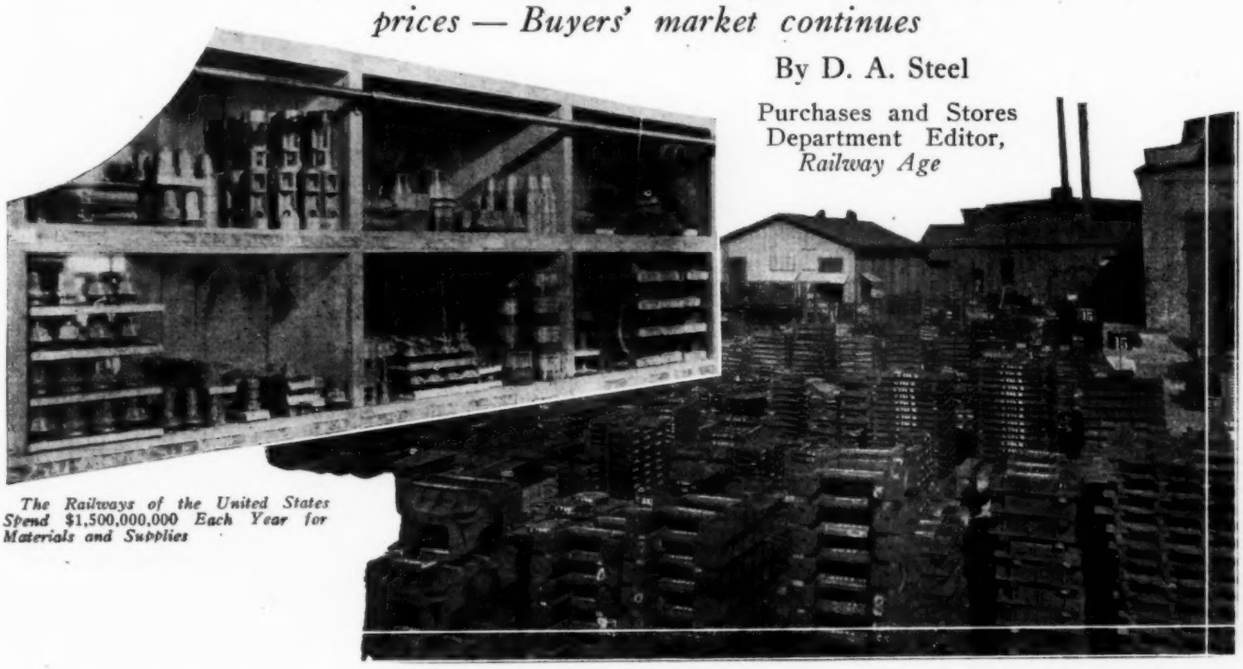
Road	Mileage operated	Mileage owned	Date of receivership	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Alabama, Florida & Gulf	32	32	June 3, 1924	None	$50,000	$50,000	
Atlantic & Yadkin	163	163	Mar. 24, 1924	$1,500,000	1,000,000	2,500,000	
Birmingham, Columbus & St. Andrews	38	19	Dec. 24, 1908	250,000	None	275,916	
Bridgton & Saco River	21	21	Oct. 1, 1927	170,000	102,250	272,250	
Bristol Railroad	6	6	July 16, 1926	100,000	100,000	235,000	
California & Oregon Coast	15	15	Feb. 18, 1925	528,200	350,000	918,200	
Cape Girardeau Northern	15	104	April 14, 1914	1,156,000	110,000	1,439,400	Sold at foreclosure Sept. 12
Caro Northern	17	17	Sept. 1, 1921	.....	.....	.....	
Castleman Valley	14	14	May 27, 1927	.....	.....	.....	
Central Vermont	493	267	Dec. 12, 1927	33,480,724	3,000,000	36,480,724	Subsidiary of Canadian National
Chicago & Alton	1,029	691	Aug. 30, 1922	84,184,000	39,955,500	128,908,300	
Chic., Milwaukee & St. Paul	11,205	10,252	Mar. 18, 1925	385,784,100	233,379,384	619,120,166	Reorganization plan waiting I. C. C. approval
Dansville & Mount Morris	18	16	June 8, 1894	150,000	50,000	206,901	
Delaware & Northern	38	38	Mar. 16, 1921	None	1,250,000	1,283,419	
Eastern Kentucky	36	36	Mar. 31, 1919	None	3,455,900	3,455,900	
Ettrick & Northern	10	10	June 28, 1912	54,300	44,000	105,950	
Gainesville & Northwestern	37	35	Dec. 8, 1923	75,000	750,000	850,000	
Gulf, Texas & Western	130	99	Jan. 24, 1921	2,000,000	500,000	2,500,000	
Kansas & Oklahoma	19	19	Apr. 17, 1923	None	288,900	288,900	
Minneapolis & St. Louis	1,628	1,514	July 26, 1923	41,359,051	25,792,600	72,870,401	
Missouri & North Arkansas	365	335	May 5, 1927	5,000,000	3,000,000	8,042,000	
Nevada Copper Belt	41	41	Apr. 2, 1925	622,000	1,000,000	1,622,000	
North & South	41	41	Aug. 1, 1924	None	None	None	Court order judgments, $4,280,080
Ohio & Kentucky	40	38	Dec. 2, 1925	442,775	300,000	752,775	
Paris & Mt. Pleasant	51	51	Feb. 26, 1920	600,000	75,000	765,000	
Pine Bluff & Northern	8	8	Feb. 9, 1916	None	160,000	160,000	
Pittsburg, Shawmut & Northern	199	178	Aug. 1, 1905	14,655,600	15,000,000	31,377,950	
Sandy River & RangeleyLakes	97	97	July 8, 1923	837,000	340,000	1,177,000	
San Luis Southern	32	32	Feb. 29, 1924	327,000	1,000,000	1,365,208	Sale Jan. 6, 1928
Saratoga & Encampment	44	44	Dec. 8, 1924	.....	.....	.....	
Savannah & Atlanta	145	145	Mar. 4, 1921	3,370,625	2,250,000	6,000,625	
Sharpsville Railroad	21	21	Jan. 21, 1897	None	350,000	350,000	
Tallulah Falls Railway	57	57	June 24, 1923	1,519,000	323,400	1,842,400	
Trinity & Brazos Valley	367	303	June 16, 1914	8,760,000	304,000	10,545,494	
Wichita Northwestern	100	100	Nov. 10, 1922	381,750	1,690,000	2,121,750	
Winchester & Western	40	40	June 21, 1926	.....	.....	.....	
Winifrede Railroad	10	10	Mar. 15, 1927	None	150,000	150,000	

Railway Material and Supply Costs in 1927

Competition and quieter conditions bring lower prices — Buyers' market continues

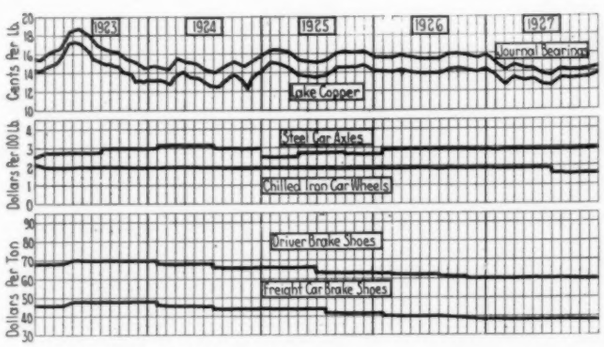
By D. A. Steel

Purchases and Stores Department Editor, *Railway Age*



The Railways of the United States Spend $1,500,000,000 Each Year for Materials and Supplies

THE past year was a good year for the railroads in the material market. Prices were lower; the business was highly competitive; production was adequate for needs; and delivery of material was excellent. How long that condition will prevail is another question. Opinions differ. The industry is expectant and it is election year. One of six railway purchasing agents doesn't see "how prices can be much lower." Another "looks for higher prices in many commodities." Another, satisfied that "very few manufacturers are making normal profits," ventures "that unless production costs cannot be reduced somewhat, higher prices will prevail." Two anticipate no advances. A sixth is sure of a downward tendency for several more years from the conviction that inflation, attendant upon the war, has not yet been completely removed. While the outcome remains to be seen, it is safe to say from a variety of considerations that any changes which take place during the year will not be large.



Price Trends of Typical Equipment Items

Notwithstanding many reductions, material costs were relatively stable throughout last year, the price trends exhibiting much resistance to recessions. Prices have simply reflected last year's business conditions which, while continuing well above the five-year average, were quieter than those of the previous year, although the volume of railway purchases when finally determined is expected to equal if not slightly exceed its predecessor.

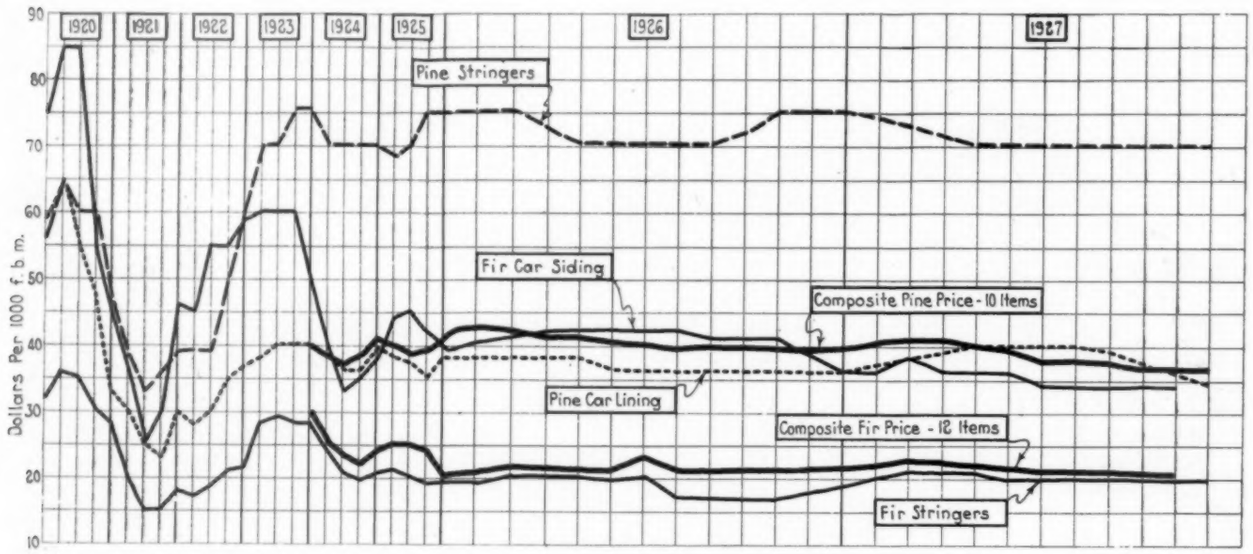
Repeated efforts were made to strengthen last year's market by curtailing production in different lines or by price fixing, but the results of these efforts in general were short-lived with few exceptions, and keen competition prevailed, evidenced by wide variations in prices quoted the railroads, by price cutting and various concessions such as freight allowances and offers to carry the stocks in consideration of definite commitments for future orders, etc. Purchasers were by no means relieved of the problems of bargaining, but it is conceded that a buyers' market prevailed.

Forest Products

It is significant of lumber conditions that during the past summer, large producers by joint agreement curtailed production in an effort to stabilize and strengthen fir prices, only to abandon the agreement in the fall. The railroad industry, as a result of these conditions, again secured favorable prices. Southern pine prices also lost ground during 1927, weakness in these prices developing early last spring.

A sidelight of the lumber situation is gained from an analysis of average prices paid by several roads. Bridge

stringers were obtained for less at the close of the year than at the beginning on two out of seven roads, but remained stationary on three, and increased $3.60 per thousand in one case; while the price of fir boards dropped in two cases, but remained stationary in two cases and advanced in another case; increases were noted also in the prices of car sills and pine boards paid by some roads. This condition suggests the relative instability of lumber prices and particularly the responsiveness to changes, notwithstanding the competitive character of the market.



Mill Price Variations of Lumber Items, 1920 to 1928

The Tie Market

During 1927, seven roads paid from $0.79 to $1.06 for fir ties, depending on the size and haul, from $0.67 to $1.37 for pine and $1.05 to $1.62 for oak. Seven out of 14 prices examined remained stationary throughout the year. Conditions surrounding production cause so much variation in the prices paid for cross ties in one territory as compared with others that it is difficult to measure the market in any year, but it appears that prices in general were the same or less last year than in the previous year. The floods of last summer seem to have stimulated production. Also the market has been so favorable that some roads have suspended sight draft payments and those roads which had correctly anticipated their needs during 1927 had no difficulty obtaining their requirements at favorable prices.

Coal

Immediately following the suspension of mining in the union fields last spring, there was a slight increase in the cost of coal to all roads in the Southwest, and the Middle-Western roads were compelled to enter the fields of West Virginia and Eastern Kentucky. However, with the railroads well supplied with storage coal in anticipation of the strike, the effect on the market apart from seasonal changes, was small during the summer months; and any advances in prices in the Kentucky and West Virginia fields that took place when western railroads entered this market, were lost upon the resumption

Douglas Fir Mill Prices—Actual Railway Purchases—Year 1927

Items	Dec.*	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
Stringers, 8 by 16, 32 ft., No. 1 common	$19	$20	$21	$21	$21	$20	$20	$20	$20	$20	$20	$19
Timbers, 12 by 12, 32 ft. and less, No. 1 common	17	17	17.5	18	17	17	17	17	17	17	17	17
Dimensions, 2 by 6 and 8, No. 1 common	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16	16.5	16.5	16.50
Dimensions, 2 by 12, No. 1 common	17	17	17	17	17	17	17	17	17	17	17	17
Boards, 1 by 6, No. 1 common	17	17	17	17	17	17	17	17	17	17	17	17
Car framing, select common	21	21	22	22	21	21	21	21	21	20	20	19
Car sills, 41-45 ft.	25	25	25	25	25	25	25	25	25	24	24	23
Car siding, No. 2 clear and better	36	36	38	36	36	36	34	34	34	34	34	30
Car lining, select common, D. & M.	25	25	25	25	25	25	25	25	25	25	25	25
Car decking, finished, select common, D. & M.	23	23	21	21	21	21	20	20	20	20	20	20
Switch ties, common	16	17	17	17.5	17.5	17	17	17	17	17	17	17
Crossing plank, common	17	17	17	18	18	17	17	17	17	17	17	17
Average	$20.79	$20.95	$21.16	$21.16	$21.00	$20.79	$20.54	$20.54	$20.5	$20.37	$20.37	$19.79

*1926.

Southern Pine Mill Prices—Actual Railway Purchases—Year 1927

Item	Jan.	Feb.	March	April	May	June	Ju'y	Aug.	Sept.	Oct.	Nov.	Dec.
Stringers, 7 by 16, 28	$70	$70	$70	$70	$70	$70	$70	$70	$70	$70	$70	$70
Bridge material, 12 by 12, 22	40	44	40	40	40	40	40	40	40	40	40	40
Car sills, 36 ft. to 40 ft.	36	36	36	36	36	36	36	36	36	36	36	36
Car lining	38	39	40	40	40	40	40	39	38	35	35	35
Car siding, 9 ft.	51	51	51	51	51	51	45	43	41	40	40	40
Planking, white oak, 3 by 10 ft., 16 ft.	27	27	27	27	27	27	27	27	27	27	27	27
1 by 8, 14 ft.	39	40	40	40	40	39	38	37	36	36	36	36
2 by 4, 10 ft.	32	32	30	30	30	27	26	26	26	26	26	26
2 by 10, 16 ft.	36	35	35	33	33	33	33	33	33	32	32	32
Car decking, 2 in. 10 ft.	34	34	34	34	33	33	20	28	27	27	26	26
Average	$40.3	$40.8	$40.3	$40.1	$40.0	$39.6	$37.5	$37.9	$37.4	$36.9	$36.8	$36.8

of union operations in the Central West. Where additional freight was involved, the cost of coal to the railroads of course increased. This is shown in the costs of coal to Northwest roads, but it is significant of the conditions that where one road, out of nine roads studied, contracted for coal at higher prices last fall, four out of the nine bought it at lower prices, and many roads did not feel the pressure of prices enough to draw upon the coal reserve built up prior to the strike.

Average Prices Paid by Railroads for Materials in 1927

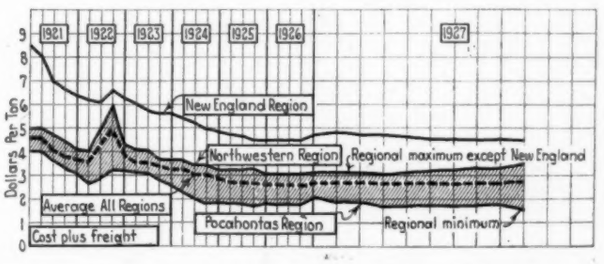
Material	Unit	Roads	Jan.	June	Dec.
Track and Building Materials					
Track bolts	100 lb.	8	$4.17	$3.98	$3.85
Track spikes	100 lb.	9	2.80	2.80	2.82
Wire nails	100 lb.	10	2.63	2.57	2.54
Tie plates, steel	N.T.	9	46.54	46.35	45.06
Structural steel, fabricated	100 lb.	5	4.23	4.23	4.07
Structural steel, angles	100 lb.	7	2.05	1.99	1.92
Track shovels, No. 2	Doz.	9	12.81	12.88	13.17
Track chisels	100 lb.	9	19.80	19.54	19.54
Wire fence, 26 in. to 55 in. woven	Rod	9	.460	.467	.468
Bond wire, 48 in. copper clad	100 lb.	7	14.83	14.75	14.77
Pipe, cast iron, 12 in. B or C	N.T.	9	41.76	41.77	39.88
Pipe, vitrified clay, 24 in.	Ft.	8	1.37	1.42	1.37
Kerosene	Gal.	9	.106	.094	.088
Rope, manila ¾ in.	Lb.	9	.224	.215	.214
Rope, wire ¾ in. 6-strand	Ft.	8	.125	.125	.125
Creosote oil	Gal.	4	.155	.158	.159
Cement	Bbl.	9	2.23	2.22	2.18
Car and Locomotive Materials					
Bolts, machine ¾ in. by 6 in.	100	9	$5.08	$5.25	$5.07
Boiler tubes 2¼ in. No. 11	Ft.	7	.172	.172	.172
Iron, No. 1 pig	N.T.	4	20.71	20.71	20.08
Iron, common bar	100 lb.	7	2.18	2.13	2.08
Steel, high speed tool	Lb.	9	.59	.59	.59
Steel, spring	100 lb.	8	2.78	2.74	2.69
Steel, boiler	100 lb.	9	2.08	2.01	1.95
Steel, black No. 28	100 lb.	9	3.25	3.19	3.18
Castings, malleable 7 to 15 lb.	100 lb.	9	9.20	9.10	9.11
Castings, steel 25 to 50 lb.	100 lb.	9	8.73	8.63	8.57
Castings, grey iron green sand	N.T.	7	77.40	77.50	76.92
Brake shoes, locomotive	N.T.	8	61.70	61.70	61.70
Brake shoes, freight	N.T.	5	36.80	37.00	37.00
Couplers, 5 by 7 by 6½	Pr.	7	26.62	26.62	26.62
Tires, locomotive over 33 in.	100 lb.	9	6.10	6.11	6.11
Wheels, cast car	100 lb.	8	1.82	1.75	1.74
Axles, rough turned car 5 by 9	100 lb.	8	2.95	2.94	2.93
Axles, locomotive driving	100 lb.	9	5.08	5.18	5.24
Other Materials					
Pipe, 1 in. black steel	Ft.	9	$ .077	$ .075	$ .077
Pig lead	100 lb.	9	7.63	6.76	6.65
Copper, soft sheet	Lb.	9	.223	.213	.220
Copper, tubing ⅜	Lb.	9	.286	.281	.274
Copper, wire No. 9 bare	Lb.	9	.154	.144	.150
Copper, wire No. 12 3b. weatherproof	Lb.	8	.187	.184	.189
Journal bearings	Lb.	8	.142	.140	.142
Car oil	Gal.	9	.194	.193	.186
Grease, driving box	Lb.	7	.162	.160	.159
Waste, colored cotton	Lb.	9	.098	.097	.098
Rubber, ⅛ sheet packing	Lb.	8	.32	.32	.32
Hose, 1½ air brake	Ft.	9	.49	.48	.48
Leather belting, 6 in. double	Ft.	9	1.22	1.22	1.24
Fire brick	Per M	9	41.11	41.40	42.73
Boiler lagging	Sq. Ft.	10	.21	.21	.21
Lime, hydrated	N.T.	9	13.63	13.63	13.63
Soda ash	100 lb.	7	1.38	1.33	1.33
White lead in oil	Lb.	9	.11	.11	.10
Linseed oil, boiled	Lb.	9	.92	.97	.76
Glass, 24 by 24 dsa	Box	9	5.41	5.29	4.99
Oxygen	100 Cu. Ft.	9	1.31	1.31	1.26
Forest Products					
Fir, bridge stringers 8 in. by 12 in. by 28 ft.	Per M Ft.	7	$35.07	$35.78	$35.30
Fir, boards 1 in. by 6 No. 1 Com. R.	Per M Ft.	6	27.81	27.80	27.81
Fir, car sills 6 in. by 10 in. by 40 ft.	Per M Ft.	6	32.90	33.25	32.91
Pine, boards, 2 in. by 4 in. S. 4 S.	Per M Ft.	5	33.80	32.60	32.40
Ties, cross all kinds	Each	7	1.12	1.11	1.05
Fuel					
Fuel oil	Bbl.	8	$2.24	$2.21	$2.07
Coal, locomotive	N.T.	9	2.59	2.52	2.44
Scrap Iron					
No. 1 railroad wrought	N.T.	8	$11.69	$11.03	$10.76
No. 1 heavy melting steel	N.T.	9	12.38	11.22	11.19
Rails for re-rolling	N.T.	8	13.72	15.38	12.32

Note.—Figures give prices less trade discount. No deductions for freight to line where prices are so quoted. Recommended as indexes of trends only.

Scrap Prices

The trend of scrap prices presents what, from a purely railway purchasing standpoint, might be designated as the one disappointing feature of the business, for while the general level of prices declined appreciably last year, prices offered for scrap iron fell badly, this time, with the railroads as producers instead of consumers and therefore compelled to dispose of their products at much less than in previous years. The chart of scrap prices plainly shows the pronounced recession in this market, and the condition is further evidenced by the prices at which railroads sold scrap. The average prices of No. 1 railroad wrought on eight roads fell from an average of $11.69 a ton to $10.76; No. 1 heavy melting steel from $12.38 a ton to $11.19, and rail for rerolling from $13.72 to $12.32. Furthermore, practically every road got less for its products in the last quarter than at the beginning of the year, the reduction reaching $2.50 a ton in several cases. It has been many years since prices for scrap were as low and since the cause is not one of temporary over-production by railroads, but rather reflects diminished demand in the industry, the situation can hardly be expected to improve until operations in the iron and steel industry are resumed on a larger scale. While the noticeably lower prices may tend to stimulate reclamation activities, its larger effect may encourage railroads to accumulate scrap rather than to sell it from month to month, and also to cause major readjustments in sorting practices to suit narrowed margins of profit between grades.

Elsewhere in this article, supplementing various charts, is a list of 66 items of railway materials with the



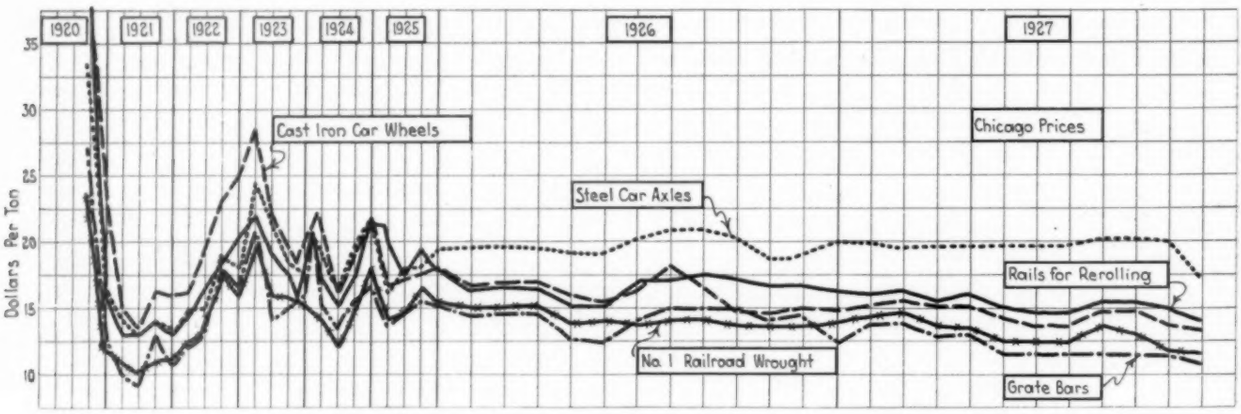
Variations in the Average Cost of Coal to Railroads from Month to Month, Freight Included, for the Various Railway Regions as Reported to the I.C.C.

average opening, mid-year and closing prices paid by 10 Class I roads with upwards of 50,000 miles of lines. Many of these prices reflect quarterly, semi-annual or annual agreements. In some cases, also, only one price was available, which made it necessary, in computing averages, to spread it over the year as though the market had not changed. The effect in both cases is to scale down fluctuations disclosed by unit prices on other roads for the same materials. Notwithstanding these conditions, however, the average prices increased in only 8 cases out of 66, did not change in 16 cases, and were less in 42 cases.

Maintenance of Way Materials Drop

One of the charts gives the trends of mill prices for track bolts, track spikes, wire nails, steel tie plates, structural steel plates and rail. Excluding rail, which has been sold at $43 per ton (base) since 1923, weakness is evident, structural material having fallen $3 a ton at Pittsburgh in October as compared with the beginning of the year. Three roads out of eight bought track bolts without term agreements. These roads and another with an agreement paid lower prices for their last purchases than for the first, the last quarter prices for the eight roads ranging from $3.45 to $4.05 per 100 lb. Three out of nine roads bought track spikes

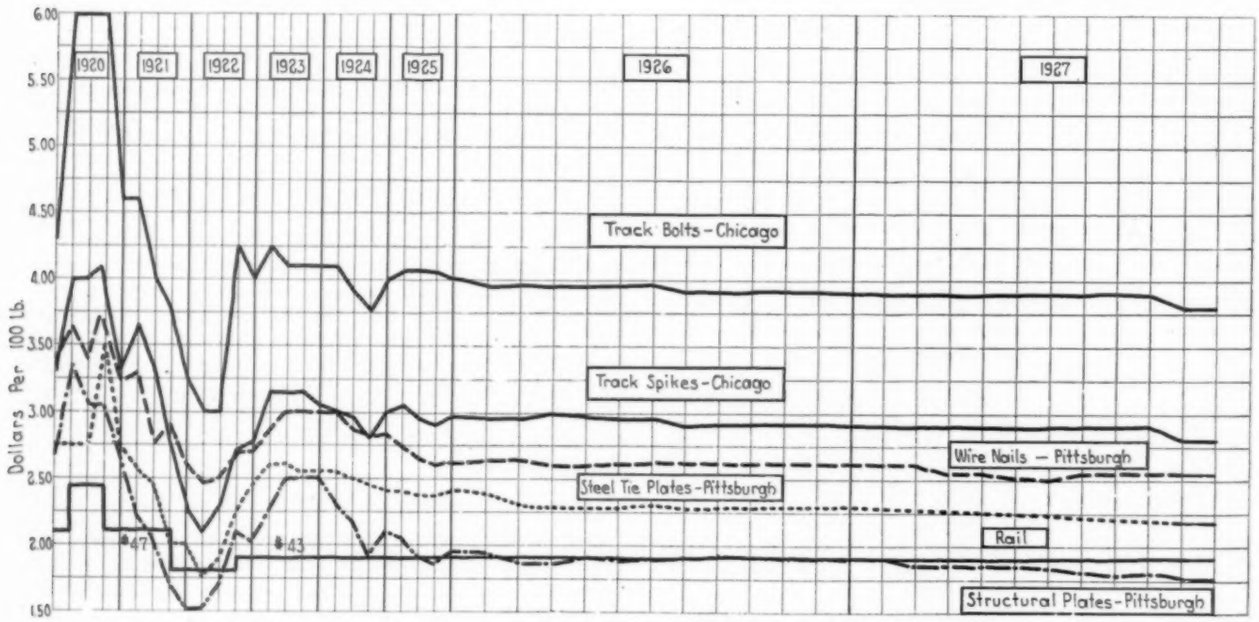
without a contract, and two of these paid less in the fall than in the spring. Eight out of 10 roads paid less for nails, the last prices ranging from $2.45 to $2.74 per 100 lb. Five roads out of nine bought tie plates without term agreements and four of them paid less, the last prices ranging from $41.30 to $50 a ton. All four roads buying fabricated steel paid less for it in December, and all nine roads, quoting on steel shapes, paid less, the f. o. b. line, in the last quarter as compared with $40 in the first quarter, and the latter price covered small as well as car lots. Prices for vitrified pipe, which ranged from $0.90 to $2.56 per ft. on eight roads, were noticeably stationary, but one road, not buying under a term agreement, got a carload price in the last quarter of $1.17 a ft. as compared with $1.53 in June and $1.40 in January.



Monthly Variation in Typical Scrap Prices in the Last Eight Years

latter prices ranging from $1.75 to $2.12 per 100 lb. With each material, some of the roads were able to purchase less than carload quantities at the same prices charged for car lots. Track shovel costs, which ranged from $9.50 to $17.50 per doz. on nine roads, remained stationary in all but two cases where the price increased; similar stability featured track chisel prices which ranged from $14.30 to $21 per 100 lb., although in the latter case a road not buying under a term agreement paid $3

The price of kerosene, ranging from 7.2 cents to 11.9 cents a gal. on nine roads, was less at the end of the year than at the beginning in every instance but one, the average reduction amounting to 15 per cent. Four out of nine roads bought manila rope currently. Two of these paid slightly more in the last quarter than in the beginning of the year, but the average was down to $1 per 100 lb., or 5 per cent. The creosote oil market was exceptional, in that the price advanced appreciably; it



Trends of Prices of Typical Iron and Steel Items Used in Roadway and Structures

per 100 lb. less at the close of the year than at the beginning.

Cast iron pipe prices began to weaken last January. One road among nine bought it for $37 a ton, f. o. b. shipping point, in the last quarter, as compared with $45 a ton in the first quarter; another paid $32 a ton,

affords one of the few cases where roads not protected by term agreements last year were in a less advantageous position than those which did.

Cement ranged from $2.05 to $2.54 per bbl. on nine roads. As usual, the price never became erratic, but nevertheless, three out of four roads not buying under

agreements paid from 10 to 20 cents per bbl. less in the last quarter.

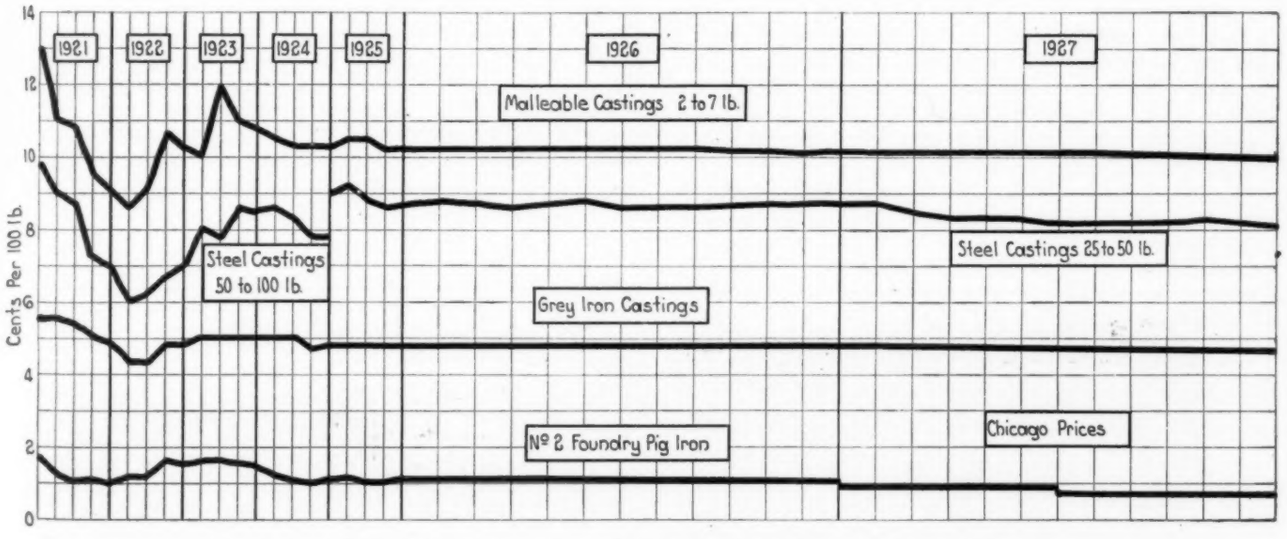
Pay Less for Castings

Twelve items in the tabulation are representative of the materials used by railroads in the repair of locomotives and cars. The prices paid for machine bolts by nine roads reporting were firm, the prices ranging between the narrow limits of $4.87 to $5.04 per 100 lb. at the close of the year, although the last average price was slightly lower; while increased prices were paid in some cases, sharp reductions were obtained on two of the roads and in one instance, a price of $5.04 per 100 lb. delivered, covered small shipments as well as car lots.

Boiler tube prices, ranging from 15 to 18 cents per ft., were stationary in every case studied. Only four out of ten roads purchased pig iron, but in each case the price declined, one road buying it for $2 per ton less in December than in January, and the average price remaining appreciably below the average in 1926. The prices, f. o. b. shipping point, ranged from $16.50 to $25 on the different roads. A five per cent reduction was realized in the prices paid by seven roads for common bar iron, which ranged from $1.85 to $2 a ton in December. High speed tool steel, ranging from 23 cents to $1.10 per lb., on eight roads, was among the few materials which remained stationary throughout the year. In contrast, spring steel, boiler steel and black iron dropped appreciably, the prices of spring steel ranging from $2.11 to $3.50 per 100 lb. in December, the average falling from $2.78 to $2.69 per 100 lb.; while boiler steel, ranging from $1.80 to $2.29 per 100 lb. on the different roads in December, fell from an average of $2.08 per 100 lb. in January to $1.95 in December; and black iron, ranging from $2.90 to $3.67 per 100 lb. on nine roads, fell from an average of $3.25 in January to $3.18 in December, $55.50 per ton, delivered, in December as compared with $58 in January, while the average price for seven roads fell from $77.40 a ton to $76.92, and one road paid the low price of $7 per 100 lb. for all its malleable castings, regardless of weight. Locomotive and car brake shoes were notably stationary and uniform on different roads, the prices of locomotive shoes, some f. o. b. shipping point and others f. o. b. line, ranging only from $60 to $65 a ton; and the prices paid for car shoes, f. o. b. destination, ranging from $34 to $38 a ton. The prices, however, were lower than the averages for the year previous.

Coupler prices for 1927 illustrate the advantages to producers, during times of active competition, of price fixing where this can be done, for in every case examined, they remained stationary throughout the year, although the price to one road covered any quantity. Leaving out A. R. A. "D" couplers, the prices, f. o. b. destination, ranged from $20.60 to $33 a pair, or an average of $26.63 a pair, all couplers being purchased under term agreements. This stationary condition was also true of locomotive tires, which ranged from $5.68 per 100 lb., f. o. b. destination, to $6.95 on nine roads, or an average of $6.11 during the year.

In the case of car wheels, where the cost to eight roads ranged from $1.54 to $1.98 per 100 lb., f. o. b. destination, in December, there were reductions on two roads from $1.90 to $1.65, and $1.63 to $1.54, respectively. This was also true of car axles, where prices, f. o. b. shipping point ranged from $2.75 to $3.12 per 100 lb., and the average fell from $2.95 to $2.93. In this case, one road paid 19 cents less per 100 lb. in December and other roads paid one price for any quantity. The prices, both shipping point and destination, for locomotive axles, which ranged from $3.98 to $8.10 per 100 lb., advanced



Trend of Mill Prices for Various Materials Used in Car and Locomotive Work

although there was one or two increases. Concessions were also offered to some roads, apparently, in the form of the same prices for small lots as for car lots.

The charts show little change in the prices of malleable castings and gray iron castings, but a steady drop in the price of steel castings. There were also reductions in prices for malleable castings and gray iron castings, however, one road paying $6.90 per 100 lb., delivered, for malleable iron in December as compared with $7.25 in January and the average for nine roads dropped from $9.20 to $9.11; and another road buying grey iron at in four out of nine cases, moving from $3.98 to $4.50 in one case, while the average price increased from $5.08 to $5.24. The charts of these materials give the relation of some of these prices to the trends of previous years where they are observed to be lower than the price levels of the previous years.

Advances in Copper

There were reductions in the average prices of pig lead, sheet copper, copper tubing and copper wire; while the journal bearing prices increased. With lead, which

ranged from $6.09 to $7.95 per 100 lb. delivered, in December, the decline was apparent in all cases examined, the average reduction being $1 per 100 lb. In the case of sheet copper, which ranged from 20 cents to 27.4 cents per lb., delivered, in December, and also in the case of copper tubing, which ranged from 25 cents to 31½ cents per lb., f. o. b. shipping point, in December, the last quarter's average was lower, but higher prices were paid in several cases. The increase in journal bearings, purchased by eight roads at prices ranging from 12.37 cents to 16.7 cents per lb., delivered, in the last quarter, was slight although evident. Copper wire, ranging from 14.1 cents to 15.8 cents a lb., f. o. b. shipping point, in December showed reductions in price for nearly all of the nine roads, although there were advances in the price of weatherproof wire, which jumped from 18¼ cents to 19½ cents per lb., f. o. b. shipping point, on one road.

Lubricants and Fuel Oil Less

The railroads effected noteworthy reductions in the cost of lubricants. Car oil, which ranged from 15 cents to 12.4 cents per gal., delivered, on seven roads, in December, cost three roads less in that month than in previous months, 5 cents less in one case, giving an average of 18.6 cents in December as compared with 19.4 cents in January; while hard grease, which ranged from 13 cents to 14½ cents per lb., delivered, in December, was available at lower prices to all but one of seven roads. The price of waste, ranging from 7 to 12½ cents per lb. in the last quarter of 1927 on nine roads, averaged as high towards the close of the year as it did in the beginning, but it was obtained at lower prices in as many cases as it rose and was sold to one road at the one price of 7.15 cents, delivered, for any amount. The average price was appreciably less during 1927 than the average for 1926.

Weakness was noticeable in the price of fuel oil, which was purchased at prices ranging from $0.75 to $2.94 per bbl., delivered, in the last quarter, the cost to one road without a term agreement having been reduced from $1.19 to $0.77, while the average for eight roads fell from $2.24 to $2.07.

In the case of rubber, which, with one exception, ranged from 16½ cents to 38 cents per lb., delivered, in December, there were no increases on eight roads and it was bought at a lower price in only one case; but the price of air hose, which ranged from 49 cents to 52 cents a lb. in the first quarter (supplied chiefly under term agreements), was sold to two roads in December at reductions from 2 to 5 cents a foot.

Leather Belting

Leather belting was stationary during the year, except for one road out of nine not buying under term agreements, where it increased from 92 cents to $1.04 per 100 lb., consistent with the substantial rise in the general leather market. Firebrick and boiler lagging also proved exceptions to the year's trend, the former ranging from $39 to $43 a thousand in December and rising $3 a thousand on three of the six roads which bought currently; while boiler lagging, ranging from 10.5 to 36.9 cents per ft., advanced in five out of eight cases, although remaining stationary in an equal number.

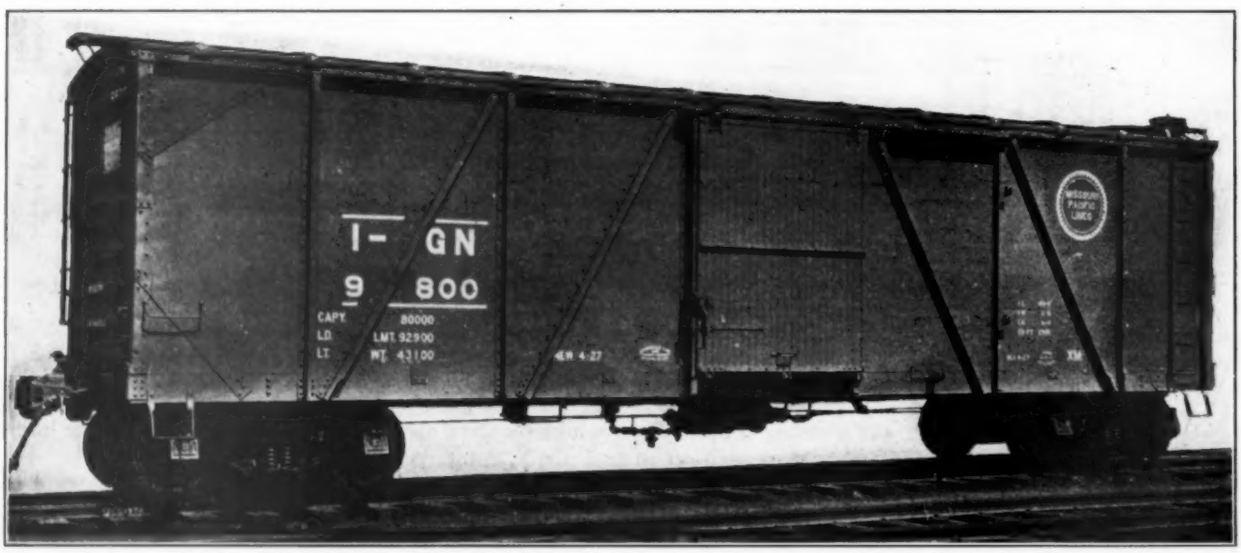
Chemicals

Hydrated lime and soda ash for water softening remained stationary to all buyers, the former ranging from $9.20 to $27 a ton, f. o. b. line, and the latter from $1.32 to $2.50 per 100 lb.; but the paint supplies, white lead in oil and linseed oil, displayed the typical weakness of prices. The former, which ranged from 10.1 cents to 11.1 cents a gal., delivered, in the last quarter, was purchased at fractional reductions in six out of nine cases; and the latter, which ranged from 7¼ cents to 11 cents per lb. delivered, dropped correspondingly on five out of nine roads, although an increase was paid by one of the nine.

Glass

Glass, which ranged from $3.44 to $6.39 a box in the last quarter, increased on one road out of nine during the year, but decreased on five roads, the average reduction amouting to 10 per cent. Oxygen, ranging from 72 cents to $2.70 per 100 cu. ft. in December on nine roads, increased from 70 cents to 90 cents for one road, but cost less to four others. Of the foregoing miscellaneous materials, there were seven instances of advances in the average price but 12 instances of reductions.

* * *

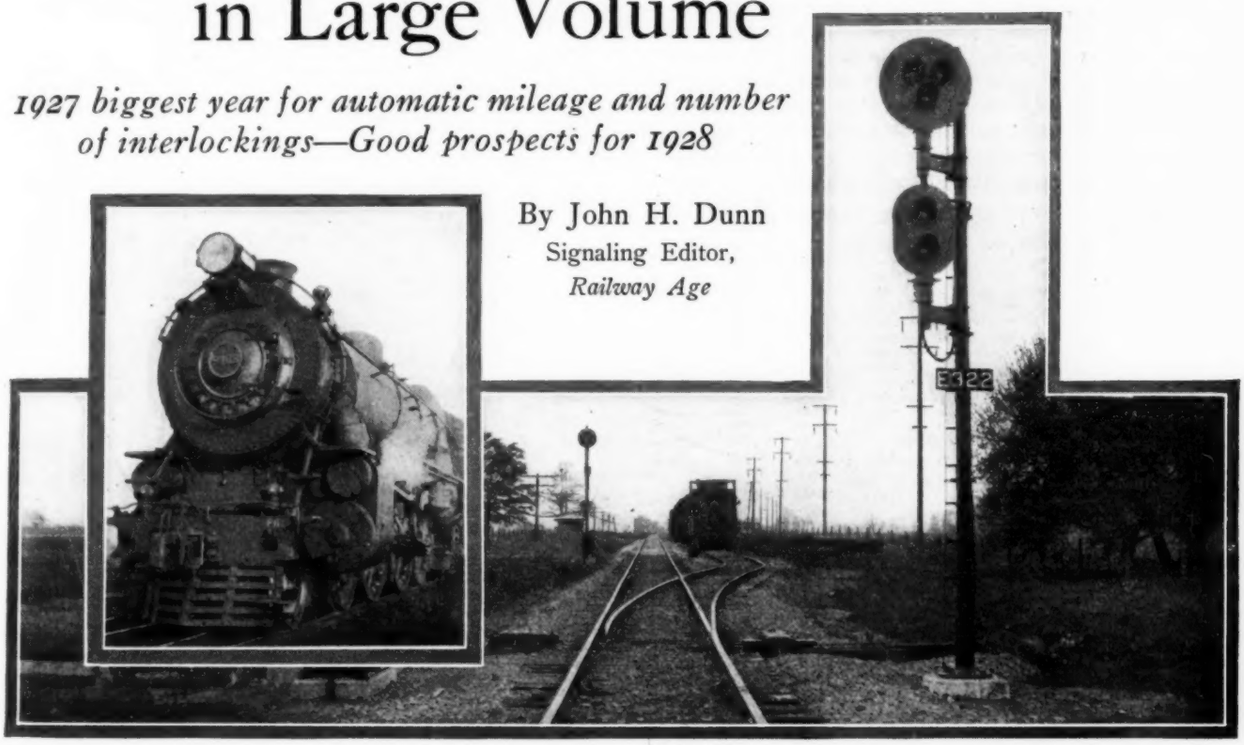


Single Sheathed Box Car Built for the Missouri Pacific by the American Car & Foundry Company

Signaling Construction Continues in Large Volume

1927 biggest year for automatic mileage and number of interlockings—Good prospects for 1928

By John H. Dunn
Signaling Editor,
Railway Age



Outstanding Developments Were Code Train Stop on Pennsylvania and Centralized Dispatching on New York Central

A NEW high record was established in 1927 for the installation of signaling facilities in the United States and Canada. Automatic signals were completed on 5,127 miles of road, 142 interlocking plants were built and 2,074 automatic highway crossing signals were installed, which, with remote control layouts, automatic interlockings and other apparatus, represented a volume of signaling equipment greater than that installed in 1926, which was the previous peak year of history.

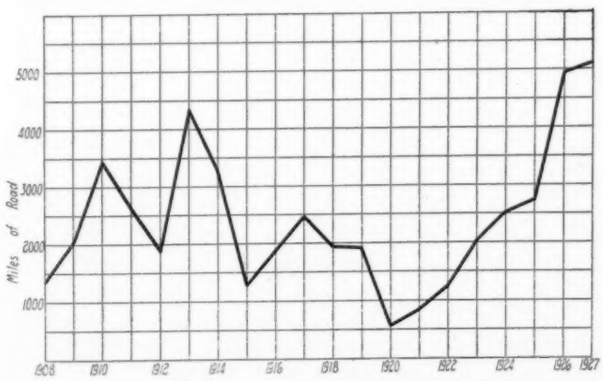


Chart Showing Miles of Road Equipped with Automatic Block Signals Each Year Since 1908

The outstanding development of the year was the placing in service of the first complete installation of the centralized dispatching system on the Ohio division of the New York Central, as described in the *Railway Age* of August 20. This installation represents the accomplishment of the idea of operating trains by signal indication without written train orders or operators at intermediate stations, all switches and signals being power-operated and under the control of the dispatcher at a central point. While much of this control equipment is a radical departure from former practice, the system is a natural outgrowth of the extension of power interlocking and signals controlled from towers or stations. No mechanical locking is provided between the levers in the machine on this dispatching system, the locking being accomplished by relays and circuits, an idea discussed with reference to interlocking plants but accomplished first on this installation. The Central of Georgia also installed a unique system of train direction on 24 miles of single track during the year, on which train movements are directed by signal indication under the control of operators. The Pere Marquette has under construc-

Total Construction 20 Years, I. C. C. Reports

Year	Miles of Road Construction of Automatic Block
1908	1,387.6
1909	2,047.1
1910	3,473.8
1911	2,623.4
1912	1,883.9
1913	4,350.5
1914	3,294.2
*1915	1,296.0
*1916	1,891.0
*1917	2,482.0
*1918	1,934.0
*1919	1,923.0
*1920	546.0
*1921	830.0
*1922	1,254.0
*1923	2,019.0
*1924	2,515.0
*1925	2,726.0
*1926	4,992.0
*1927	5,127.0

* Figures since 1915 are ours, and prior thereto figures are from I. C. C. Reports.

tion a system of centralized dispatching on 20 miles of single track.

The installations of automatic train control in compliance with the two orders of the Interstate Commerce Commission have been completed with the exception of a few details on four roads. The important development in this field during 1927 was the extensive installation of the new code system of continuous control. The thought that the train control orders of the commission would reduce the volume of automatic signal

Table A—Automatic Block Signals Completed in 1927

Road	Location	Miles of road	No. of signals	Manufacturer
A. T. & S. F.	Willow Springs, Ill. to Lockport	15.3d	21s	Union
	Plaines, Ill. to Pequot	16.2d	14s	Union
	Holliday, Kan. to Lawrence	26.2s	53s	Union
	Wichita, Kan. to Mulvane	14.7s	21s	Union
	Cicero, Kan. to Wellington	5.4d	15s	Union
	Cross, Okla. to White Eagle	6.6d	22s	Union
	Guthrie, Okla. to Oklahoma City	30.7s	50s	Union
	Osage Jct., Okla. to Ralston	1.9s	8s	Union
	Waynoka, Okla. to Tangier	47.1s	79s	Union
	Canadian, Tex. to Canyon	42.3s 73.5d	201s	Union
	Mountainair, N. M. to Belen	40.8s	76s	Union
	Bell Yard, Tex. to Somerville	35.1s	63s	Union
	Cleburne, Tex. to Birds	25.3s	54s	Union
A. C. L.	Folkston, Ga. to Waycross	33.3s	68s	Union
B. & O.	Orleans Rd., W. Va. to Magnolia	13.0d	22s	Union
	Baltimore, Md.	1.0d	4s 4cp	Union
	Camden, Md. to Bailey	0.7d	10cp	Union
	Bailey, Md. to Riverside	1.1d	10s	Union
	Storrs, Ohio to Dearborn, Ind.	11.4s 8.6d	45cp	Union
	Cochran, Ind. to Milan	15.2d	24cp	Union
Ban. & Ar.	Oakfield, Me.	1.2s	1s	G.R.S.
C. N.	Springhill, N. S.	1.3s 0.7d	4s	G.R.S.
	Coteau, P. Q. to St. Zotique	2.0d	11c	Chicago
	Brockville, Ont. to Prescott	12.0d	17c	Chicago
	Morrisburg, Ont.	....	1c	Chicago
	Iroquois, Ont.	....	1c	Chicago
	Newtonville, Ont.	....	2c	Union
	Red Bank, Ont. to Brantford	23.0d	24c	Chicago
	Paris Jct., Ont. to Ingersoll	28.0d	42c	Chicago
	Charny, P. Q. to Chaudiere	....	4s	G.R.S.
	Burlington, Ont.	....	2c	Chicago
	Mimco, Ont.	....	1c	Chicago
	Mount Royal, P. Q.	....	1c	Chicago
	Sioux Lookout, Ont.	....	1s	Union
	Carman Jct., Man. to Pacific Jct.	2.0s 2.0d	9s	Union
G. T.	Mundy, Mich. to Belsay	11.7d	20s	.....
C. P.	Trois River, Que. to Piles Jct.	5.1s	10c	G.R.S.
	Smith Falls, Ont.	2.8s	4c	G.R.S.
	Streetsville, Ont. to Guelph Jct., Ont.	16.5d	29c	G.R.S.
	St. Luc Jct., Que.	1.4d	6s	Hall
	Guelph Jct., Ont.	....	2s	Union
	Field, B. C. to Leanchoil	16.5s	32s	Union
	Albert Canyon, B. C. to Revelstoke	20.0s	35s	Union
C. R. N. J.	Bound Brook, N. J. to Raritan	4.0f	26c	Union
	Elizabethport, N. J. to Woodbridge Jct.	2.0f 7.5d	33s	Union
	Branchport, N. J. to Bay Head	16.8d	51c	Union
C. & O.	Pikes Crossing, Ky. to Clyffeside	3.0s 2c	1s	Union
	Russell, Ky. to Riverton	5.0s	4s	.....
	Joliet, Ill. to Mazonia	24.1s	32c	G.R.S.
C. & A.	Joliet, Ill. to Pequot	18.6s	11s	G.R.S.
	Macon, Mo. to Monroe	39.3s	75c	G.R.S.
C. B. & Q.	Mark, Mo. to Palmyra	8.7s	14c	G.R.S.
	Kenesaw, Neb. to Holdrege	38.8s	66c	G.R.S.
	Dorchester, Neb. to Harvard	52.6s	76c	G.R.S.
	Culbertson, Neb. to Wray, Colo.	78.5s	196c	G.R.S.
	Furdy, Wis. to Bluff Sdg.	10.0d	18c	G.R.S.
	Diamond Bluff, Wis. to Prescott	10.7d	16c	G.R.S.
C. G. W.	South Des Moines, Iowa to Diagonal	75.0s	61c	Union
C. R. I. & P.	Blue Island, Ill. to Joliet	23.0s	17s	Union
	McFarland, Kan. to Jones	22.0d	48c	Union
C. S. S. & S. B.	South Bend, Ind. to Michigan City	24.0s	55c	Union
	Burns, Ind. to Meadow Brook	2.5d	8c	Union
	Taylor, Pa.	....	3s	Union
D. L. & W.	Palisade, Colo. to Minturn	134.5s	208c	G.R.S.
D. & R. G. W.	St. Paul, Minn. to Minneapolis	8.2d	34c	G.R.S.
G. N.	Winton, Wash. to Gaynor	12.3s	27c	G.R.S.
	Duluth, Minn.	2.2d	12s	G.R.S.
I. C.	Chicago to Broadview, Ill.	0.5s 11.9d	35c	Union
	Ballard Jct., Ky. to Fulton	41.2d	81c	Union
	Curve, Tenn. to Woodstock	50.4d	64c	Union
Interboro	Q'boro Subway, 5th Av. to 8th Av.	....	6c	.....
	Carona line	....	83c	.....
	Astoria line	....	38c	.....
	Queensboro Subway	....	7c	.....
	Third Ave., single track, both directions. 149 St. to 179 St.	....	...	.....
L. I.	Lynbrook, N. Y. to Wreck Lead	4.0d	11c	Union
	Fresh Pond, N. Y. to Bay Ridge	4.0f	4c	Union
L. & N.	Pascagoula, Miss. to Mobile, Ala.	39.5s	78s	G.R.S.
	Flanagan, Ky. to Ophelia	12.5d	26s	Union
	Lebanon Jct., Ky. to Elizabethtown	14.0d	33s	G.R.S.
	Conway, Ky. to Sinks	10.0d	28s	Union
Me. C.	Bath, Me. to Woolwich	1.0s	3s 1c	Union
M-K-T	Dallas, Tex. to Sargent	2.2s	2c	Union
M. P.	Little Rock, Ark.	1.0s 1.1d	10c	Han.B.
	St. Louis, Mo.	0.4s	6c	Han.B.
	Washington, Mo. to Etlah	19.1d	26c	Han.B.
	Moreau River, Mo. to Jefferson City	3.3d	9c	Chicago
	Little Rock, Ark. to Benton	22.9d	...	G.R.S.
	Wynne, Ark. to Briark	48.8s	89c	G.R.S.
	Hoxie, Ark. to Walnut Ridge	4.2d	10c	G.R.S.
	Smithton, Ark. to Bierne	7.1d	13c	G.R.S.
	Various places	....	7s 3c	.....
N. C. & St. L.	Nashville, Tenn. to Bridgeport, Ala.	100.7s 13.5d	12s 209c	Union
N. & W.	Roanoke, Va. to Winston-Salem, N. C.	121.0s	349p	Union
	Bluefield, Va. to Norton	100.4s	299p	Union
	Tug, W. Va. to Wilcox	5.0d	11s	Union
	Dry Fork Jct., W. Va. to Auville	2.5d	6s	Union
	Williamson, W. Va.	1.0s	5s	Union
N. O. P. & L. (Elec.)	Akron, Ohio to Springfield	5.0s	6c	Nachod
	Barberton, Ohio	5.0s	6c	Nachod
	Akron City, Ohio	1.0s	4c	Nachod
N. P.	Logan, Mont. to Whitehall	39.0s	48c	Chicago
	Butte, Mont. to Warm Springs	25.5s	32c	Chicago
	Peak, N. D. to Berea	6.4s	14s	G.R.S.
N. Y. C.	Lockport Jct., N. Y. to Suspension Bridge	17.0d	35c	Union
	Voorheesville, N. Y. to Schenectady	9.0t	27c	Union
	Weehawken, N. J. to W. Englewood	9.0f	36c	Union
	Carson, Ohio to Dorset	1.0s 5.9d	13s	G.R.S.
	Latimer, Ohio to Brookfield	5.9d	12s	Feder.
	Berwick, Ohio to Stanley	37.3s 3.3d	102c	G.R.S.
C.C.C. & St. L.	Glen Echo, Ohio to Bellefontaine	25.8d	48c	Union
	Bellefontaine, Ohio to Quincy	12.7d	20c	Union
	Marion, Ohio to Bellefontaine	39.3d	68c	Union
	Dix, Ind. to Beech Grove	8.1d	14c	Union
N. Y. C. & St. L.	State Line, N. Y. to No. East, Pa.	6.4s	8c	Union
	Conneaut, Ohio to Madison	26.0d	35c	Union
	Madison, Ohio to Euclid	28.5s	44c	Union
	Euclid, Ohio to Kishmans	46.3d	85c	Union
	Kishmans, Ohio to Kimball	21.6s	36c	Union
	Kimball, Ohio to Arcadia	46.0d	67c	Union
	Chicago (93rd St. to 71st St.)	2.3d	4c	Union
N. Y. N. H. & H.	Attleboro, Mass. to Sharon Hgt.	12.4d	24d	G.R.S.
	Atlantic, Mass. to Braintree	4.7d	24c	Union
Penna.	Liddonfield, Pa. to No. Philadelphia	9.0f	...	Union
	Paoli, Pa. to Downington	11.0f	...	Union
	Oil City, Pa. to Parkview	2.2d	4p	Union
	Sturgeon, Pa., to Bulger	7.0d	24p	Union
	Collier, W. Va. to M. P. 42	6.0f	23p	Union
	M. P. 71 to Newark, Ohio	86.0d	120p	Union
	Sturgeon, Pa. to Oakdale	2.0d	4p	Union
	Cleveland, Ohio	5.2d	12p	Union
	Douglas, Ohio	....	4p	Union
	Kirby, Ohio	....	2p	Union
	Forest, Ohio	....	1p	Union
	Adams, Ind.	....	5p	Union
	Ft. Wayne, Ind.	....	1p	Union
	Winona Lake, Ind.	....	1p	Union
	Plymouth, Ind.	....	1p	Union
	Anoka Jct., Ind. to Logansport	3.6d	6s 2p	Union
	Logansport, Ind. to North Judson	41.8d	48s	.....
	Columbus, Ohio to Urbana	48.0d	60p	Union
	Urbana, Ohio to Piqua	24.0t	46p	Union
	Piqua, Ohio to Bradford	12.0d	12p	Union
	Bradford, Ohio to New Paris	30.0s	32p	Union
	New Paris, Ohio to Richmond, Ind.	3.0d	4p	Union
	Richmond, Ind. to Knightstown	37.0d	46p	Union
	Knightstown, Ind. to Gem	16.0s	20p	Union
	Gem, Ind. to Hawthorne Jct.	8.0d	18p	Union
	Richmond, Ind.	2.5d	13p	Union
	Hawthorne Jct., Ind. to Indianapolis	6.7	18p	Union
	Casey, Ill., to Brownstown	55.6d	37p	Union
	Pierron, Ill. to East St. Louis	36.0d	37p	Union
P. M.	Hoyt, Mich. to Bridgeport	5.0d	9c	Union
	Mt. Morris, Mich. to Flint	4.0s 7.0d	17c	Union
Sac. No.	Sacramento, Calif.	1.0s	4c	.....
S. A. L.	Savannah, Ga. to Jacksonville, Fla.	134.8s	244c	Union
	Starke, Fla. to Coleman	88.5s 7.8d	164c	Union
Sou.	Salisbury, N. C. to Asheville	134.2s 6.5d	277c	G.R.S.

Road	Location	Miles of road	No. of signals	Manufacturer
	Charlotte, N. C. to Columbia, S. C.	108.1s	214c	G.R.S.
	Biltmore, N. C. to Hayne, S. C.	62.0s 3.2d	136c	G.R.S.
	Bristol, Tenn. to Morristown..	89.0s	169c	G.R.S.
	Knoxville, Tenn. to Ooltewah.	94.6s 2.0d	185c	G.R.S.
	Ooltewah, Tenn. to Dallas, Ga.	103.6s	200s	G.R.S.
	Stevenson, Ala. to Memphis, Tenn.	266.2s 7.8d	474c	G.R.S.
	Citico, Tenn. to Ooltewah....	12.7d	25c	G.R.S.
N. O. & N. E...	Meridian, Miss. to Ellisville..	61.7s	123s	G.R.S.
	Estabuchie, Miss. to Hattiesburg	7.5s	15s	G.R.S.
G. S. & F.....	Macon, Ga. to Grand Crossing, Fla.	253.1s 3.5d	458c	G.R.S.
St. J. Term.....	Grand Crossing, Fla. to Jacksonville	0.6s 2.3d	6c	G.R.S.
S. P.				
T. & L. Lines..	Morgan City, La. to Berwick..	3.0s	18s 1c	Union
	Lake Charles, La.....	2.6s	13s	Union
	Sanderson, Tex. to Mexon....	29.5s	56s	Union
	Marfa, Tex. to Hot Wells.....	77.5s	165s	Union
	Nelleva Jct., Tex. to Hearne Jct.	43.7s	98s	Union
	Mexia, Tex. to Corsicana.....	28.6s	77s	Union
	Garrett, Tex. to Miller.....	20.9s	58s	Union
	Metzger, Tex. to Dallas.....	1.6d	10s	Union
Pac. System....	Obispo, Calif. to Hadley.....	7.0d	14s 6s	Union
	Wellton, Ariz. to Picaho.....124.5s		217s	Union
St. L. S. W.....	Tyler, Tex. to Yards.....	1.0s	3s 3c	Union
T. & P.	Dallas, Tex. to Ft. Worth....	30.0s	49c	G.R.S.
	Hodge, Tex. to Ft. Worth....	4.3s	10c	G.R.S.
	Marshall, Tex. to Texarkana..	67.2s	108c	G.R.S.
U. P.				
O. W. R. & N..	Kamela, Ore.	1.4d	5s	Union
O. S. L.....	Dietrich, Idaho to Shoshone...	6.9d	17s	Union
	Minidoka, Idaho to Max.....	1.3d	2s	Union
	Extension of passing tracks...	....	26s	Union
L. A. & S. L...	Lynndyl, Utah to Thomas, Nev.	160.0s	271c	Union
	Farrier, Nev. to Daggett, Calif.	234.8s	423c	Union
Wabash	Adrian, Mich. to Ennis.....	10.0d	4s 15c	Union
	Adrian, Mich. to Britton.....	11.2d	3s 19c	Union
	Franklin, Ohio to Montpellier.	10.5d	21c 1s	Union
	Tolleston, Ind.	....	...	Union
	Montpelier, Ohio	1.5d	3c	Union
	State Line, Ind.	...	1s	Union
	Totals.....	3,771.2s	2,395s	
		1,278.0d	5,958c	
		33.0t	1,195p	
		45.0f	83cp	
		5,127.2	9,631	

Legend—
In "Miles of Road" column: s=Single track. d=Double track. t=Three tracks. f=Four tracks.
In "No. of Signals" column: s=semaphore. c=Color-light. p=Position-light. cp=Color-position-light.

construction decidedly, has proved to be ill-founded as is demonstrated by the large signaling programs of the past two years.

Automatic Signaling Completed in 1927

The completion of automatic signals on 5,127 miles of road in 1927 established a new record, comparing with 4,992 miles in 1926; the next earlier record being established in 1913, when 4,350 miles were equipped. Of the total mileage signaled in 1927, about 3,771 miles were on single track, an increase of 771 miles as compared with the previous year. Several of these installations were extensive, as for example 1,108 miles on the Southern, 395 miles on the Los Angeles & Salt Lake and 264 miles on the Atchison, Topeka & Santa Fe. The double-track mileage equipped with signals in 1927 totaled 1,278 miles of road, a decrease of 662 miles as compared with 1926. This total represented a number of short installations, indicating that the bulk of the important double-track mileage of the country is equipped with signals. The longest section of double track equipped with automatics in 1927 was 86 miles on the Pennsylvania.

The increased preference for light signals is indicated by the fact that of the total 9,597 automatic signals installed last year, 7,102 were light signals and 2,495 semaphores. The majority in favor of the light signal is increasing from year to year; in 1926 there were 3,229 more light signals installed than semaphores and this difference was increased to 4,707 in 1927. Of the light signals used last year, 5,824 were color-light, 1,195 position-light and 83 color-position-light.

For the first time in several years alternating current signaling has been installed extensively, a total of 1,623 miles of road being equipped in 1927, of which 1,149 miles were on the Southern and 314 on the Pennsylvania, in both cases automatic train stops being applied as a part of the installation.

Especially where light signals are used, the idea of utilizing alternating current power for normal signal operation is finding increased preference, in which case storage or primary batteries are used for the track and line circuits and for emergency operation of the signals in case of a power failure. The a-c. floating

Table B—Automatic Block Signals Under Construction, December 31, 1927

Road	Location	Miles of road	No. of signals	Manufacturer
A. T. & S. F....	Landco, Cal. to Angiola.....	52.3s	85s	Union
	Landco, Cal. to Oil Jct.....	3.2s	7s	Union
A. C. L.....	Winter Park, Fla. to Orlando.	7.3d	15s	Union
C. R. N. J.....	Woodbridge Jct., N. J. to Raritan River	1.6f	8c	Union
	Raritan River, N. J. to Branchport	21.3d	63c	Union
C. & O.....	St. Albans, W. Va.....	....	1s	.....
D. L. & W.....	Binghamton, N. Y. to Elmira..	57.0d	95c	Union
	Boonton, N. J. to East Dover.	8.0f	28c	Union
M. P.	Herman, Mo. to Gasconade...	11.8d	...	.....
	Isbell, Mo. to Osage.....	8.0d	...	.....
	Bald Knob, Ark. to Wynne...	44.7s	...	.....
	Clear Lake Jct., Ark. to Texarkana	10.3d	...	.....
	Bald Knob, Ark. to Little Rock	56.9d	...	.....
N. Y. C.....	Rochester, N. Y. to Lockport.	53.0d	104c	Union
	Iona Island, N. Y. to Newbrgh	15.0d	30c	Union
	Englewood, N. J. to Dumont..	4.0f	16c	Union
C. C. C. & St. L.	Bellefontaine, Ohio to Kenton.	23.3d	38c	Union
	Cincinnati, Ohio to Greensburg, Ind.	59.5d	110c	Union
N. Y. N. H. & H.	Saybrook, Conn. to Sound View	4.6d	9c	Union
	Hill's Grove, R. I. to Auburn.	5.7d	5c	Union
Penna.	West Philadelphia, Pa. to Wilmington, Del.	27.5m	...	Union
	West Philadelphia, Pa. to West Chester	29.0m	...	Union
	Kouts, Ind. to Schererville....	27.1d	26s	.....
	Cincinnati, Ohio to Clare.....	3.7d	5p	Union
	Bridgeport, Mich. to Mt. Morris	20.0s	28c	Union
P. M.				
Reading	Jenkintown, Pa. to Yardley.	9.7d 0.7e 9.4f	70c	Union
	Newton Jct., Pa. to Neshaminy Falls	10.3d 1.7t	31c	Union
	Nicetown, Pa. to Gladwyne..	3.9d 1.3t	25c	Union
St. L.-S. F.....	Bridge Jct., Ark. to End-D-Trk	5.0s	12s	Union
S. P.				
T. & L. Lines..	Corsicana, Tex. to Ennis.....	19.6s	55s	.....
Pac. System ...	Davis, Calif. to Woodland....	10.0s	14s 8c	.....
	Hershey, Calif. to Coyle.....	5.0s	8c	.....
	Woodland, Calif. to Tehama...	21.0s	53c	.....
	Berg, Calif. to Tehama.....	25.0s	50s	.....
U. P.				
O. S. L.....	Kimama, Idaho to Dietrich...	10.7d	12s	Union
	Totals.....	205.8s	277s	
		399.1d	729c	
		3.7t	5p	
		23.0f		
		56.5		
		688.1		

In "Miles of Road" column: s=Single track. d=Double track. t=three tracks. f=four tracks.
In "No. of Signals" column: s=semaphore. L=Lower quadrant. c=Color-light. p=Position-light.

method, using storage batteries charged by alternating current through rectifiers, was applied in 1927 on 2,011 miles of road while the same method of a-c. power supply with primary battery for the track circuits was used on 618 miles of this total. The use of a-c. power for normal operation, with primary battery for emergency signal operation as well as the track circuits, is known as the a-c. primary system, which was used on 136

miles last year. Especially for semaphore signals and in some cases for light signals where commercial alternating current is not readily available, certain roads use the straight primary battery for operation of the signal and track circuits and this system was employed on 885 miles of signaling installed in 1927.

Table C—Automatic Block Signals Contemplated for 1928

Road	Location	Miles of road	No. of signals	Manufacturer
A. T. & S. F.	Newton, Kan. to Wichita	24.0s	24s	
	Richmond, Kan. to Iola	38.0s	44s	
	Newkirk, Okla. to Cross	9.0s	7s	
	White Eagle, Okla. to Guthrie	55.0s	78s	
	Saginaw, Tex. to Gainesville	56.8s	104s	
	Riverside, Cal. to Corona	14.3s	32c	
	Riverside, Cal. to Colton	6.0d	14c	
	Hobart, Cal. to Fullerton	19.3s	38c	
	Chambers, Ariz. to Winslow	80.7d	160c	
	Belen, N. M. to Dalies	10.3s	13c	
	Wellington, Kan. to Mayfield	8.1d	...	
	Attica, Kan. to Waynoka, Okla.	50.1s 9.8d	...	
	Shattuck, Okla. to Canadian, Tex.	40.7s	...	
	Hereford, Tex. to M. P. 606	6.5s	...	
	Southland, Tex. to Cap Rock	14.1s	...	
	Defiance, N. M. to Chambers, Ariz.	38.8d	...	
	San Bernardino, Calif. to Colton	3.7d	...	
	Sweetwater, Tex. to Pyron	17.0s	...	
	Ft. Sumner, N. M. to Ricardo	13.5s	...	
	Cardenas, N. M. to Willard	80.3s	...	
B. & O.	Patterson Creek, W. Va. to McKenzie	6.3d	...	
	Viaduct Jct., Md. to Blaser	80.1d	...	
	West End, W. Va. to East Grafton	15.7d	...	
	Grafton, W. Va. to Parkersburg	103.0d	...	
	Akron Jct., Ohio to Warwick	15.6d	...	
	Newark, Ohio to Columbus	33.2d	...	
	North Lima, Ohio to Pennsylvania Jct.	68.1d	...	
C. N.	Springhill, N. S.	....	2s	
	Rimouski, Que.	3.5s	5s	
C. I. & L.	Hitchcock, Ind. to Borden	22.0d	42s	
D. & R. G. W.	Canon City, Colo. to Cleora	52.0s	...	
	Salida, Colo. to Minturn	71.0s 16.5d	...	
	Soldiers Summit, Utah to Moark	37.0d	...	
	Price, Utah to Soldiers Summit	7.0s 25.0d	...	
Erie	Meadvile, Pa. to Salamanca	10.1s 92.4d	190c	
G. N.	Brook Park, Minn. to Sandstone	17.0s	...	
	Apple Yard, Wash. to Peshastin	19.9s	...	
	Peshastin, Wash. to Winton	16.4s	...	
	Gaynor, Wash. to Scenic	11.0s	...	
L. I.	Fresh Pond, N. Y. to Bay Ridge, N. Y.	....	5c	
	Sayville, N. Y. to Patchogue	3.3d	11s	
N. C. & St. L.	Bridgeport, Ala. to Chattanooga, Tenn.	27.9d	6s 46c 46c	
N. Y. C.				
I. H. B.	Calumet Fk., Ill. to Blue Island	8.1d	...	
	McCook, Ill. to Broadview	5.4d	...	
N. Y. N. H. & H.	Waterford, Conn. to New London	4.0d	19c	
	Groton, Conn. to Midway	3.3f	6s	
	Midway, Conn. to Mystic	4.3d	8s	
Pac. Elec.	Walker, Cal.	....	4c	
	Vineyard, Cal. to Sherman Jct.	3.1d	16c	
	Rivas, Cal. to Glendora	3.6s 0.7d	15c	
	Los Nogales, Cal. to Rio Vista	0.5s 0.4d	4c	
	Wilcox Av., Cal. to Lankershim	0.9s 0.1d	4c	
	Corina, Cal. to LaVerne	6.4s 0.2d	21c	
	Valley Jct., Cal. to Romona	6.4d	17c	
Reading	Shippensburg, Pa. to Lurgan	2.3d	8c	
	Philadelphia, Pa. to Shawmont	5.9d	15c	
St. L.-S. F.	Tulsa, Okla. to Bristow	21.0s 14.0d	52s	
	Thayer, Mo. to Black Rock, Ark.	50.0s	80s	
	Harvard, Ark. to End-D-Trk	4.9d	9s	
S. P.	Polvo, Calif. to Vail	13.4s	8s	
T. & P.	Dallas, Tex. to Longview Jct.	120.0s	...	
	Ft. Worth, Tex. to Eastland	105.0s	...	
	M. P. 9, La. to Livonia	105.0s	...	
U. P.	Denver, Colo. to Limon	88.2s	162c	
O. S. L.	Owinza, Idaho to Dietrich	4.5d	15ps	
	Wapi, Idaho to Minidoka	8.3d	12s	
	Extension to passing tracks	....	14s	
	Fort Hall, Idaho to Idaho Falls	37.2s	94c	
Wabash	Litchfield, Ill. to Mt. Olive	6.0s 6.0d	9s	
	Lodge, Ill., to Bement	13.0d	18s	
	Orland, Ill. to Chicago	13.0d	...	
	Boody, Ill. to Taylorville	18.0d	24s	
	Staunton, Ill. to E. St. Louis	32.0d	44s	
Totals		1,237.0s 847.8d 3.3f	645s 1,037c	
		2,088.1		

In "Miles of Road" column: s=Single track, d=Double track, f=Four tracks.
In "No. of Signals" column: s=Semaphore, L=Lower quadrant, c=Color-light.

Highway Crossing Protection Increased

In order to reduce the number of accidents at highway grade crossings, the railroads installed 2,135 automatic highway crossing signals in 1927 as compared with 1,560 in 1926. Of the signals installed in 1927, 733 were of the wig-wag type and 1,412 of the flashing-light type, both of which conform to the A. R. A. Signal Section standards. In a few cities the railroads have been requested by city authorities during the year to install the same type of street traffic color-light signal at railroad crossings of streets as is used at the principal street intersections throughout the city. The Atchison, Topeka & Santa Fe provided these traffic type signals at 10 crossings in Beaumont, Tex., and the Atlantic Coast Line equipped 23 crossings in Orlando, Fla., while the Southern provided these signals in lieu of gates at four crossings in Memphis, Tenn. A new type of crossing gate, with special features making it adaptable for electrical operation with automatic control by track circuit, has been tested during 1927 on the Chicago, Milwaukee & St. Paul and the Chicago, North Shore & Milwaukee.

Interesting Features of Interlocking Construction in 1927

The interesting feature of interlocking construction in 1927 was the noticeable increase in the number of

Table D—Interlocking Plants Completed During 1927

Road	Location	Manufacturer	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elec.-Mech.: Mech.	Elec.-Mech.: Elec.
A. T. & S. F.	Pawhuska, Okla.	....	8	..	..	..	..
	Ponca City, Okla.	Union	..	..	..	7	5
	Canyon, Tex.	Union	..	14	..	..	..
	Chambers, Ariz.	....	..	..	..	..	..
A. C. L.	Zephyrhills, Fla.	Union	13	..	..	..	..
	Trilby, Fla.	Union	..	..	..	10	3
	Vitis, Fla.	Union	..	..	..	7	4
	Drifton, Fla.	Union	17	..	..	..	..
	Tice, Fla.	Union	5	..	..	..	..
	Dunnellon, Fla.	Union	..	..	..	7	6
B. & O.	Bates, Ohio	....	..	60	..	..	..
B. & M.	Mystic Jct., Mass.	Union	..	..	11	..	..
C. N.	Transcona, Man.	....	3	..	..	..	..
C. R. of N. J.	Raritan, N. J.	Union	..	..	29	..	..
C. & O.	Gauley, W. Va.	....	..	..	..	12	6
C. B. & Q.	Waltonville, Ill.	....	13	..	..	..	..
C. R. I. & P.	Mokena, Ill.	....	..	..	..	8	5
	Volland Kan.	....	..	..	..	6	4
Interboro	149th St. and 3rd Av.	....	..	..	27	..	..
	164th St. and 3rd Av.	....	..	..	15	..	..
	Corona Av.	....	..	..	67	..	..
	Willets Pt. Bvd.	....	..	..	19	..	..
	Main St., Flushing	....	..	..	11	..	..
	7th Av. O'boro line	....	..	..	11	..	..
L. V.	Treichler, Pa.	G.R.S.	19	..	..	..	..
	Tifft Farm Jct., N. Y.	G.R.S.	27	..	..	..	..
L. I.	Brooklyn, N. Y. "A"	Union	..	..	20	..	..
	Brooklyn, N. Y. "B"	Union	..	..	19	..	..
	Brooklyn, N. Y. "C"	Union	21	..	..	..	..
	Long Beach, N. Y.	Union	6	..	..	..	..
L. & N.	Elizabethtown, Ky.	G.R.S.	..	..	..	4	7
Me. C.	Bath, Me.	Union	..	3	..	..	..
M. P.	Bryant, Ark.	....	10	..	..	..	5
	New Augusta, Ark.	....	5	..	..	..	3
N. Y. C.	Weehawken, N. J.	G.R.S.	..	53	..	..	..
	New Durham, N. J.	G.R.S.	..	50	..	..	..
	Little Ferry, N. J.	G.R.S.	..	44	..	..	..
	W. Haverstraw, N. Y.	G.R.S.	..	25	..	..	..
	Corfu, N. Y.	G.R.S.	..	..	..	24	24
	Chili Jct., N. Y.	G.R.S.	..	..	..	23	26
	Buffalo, N. Y. (SS47)	G.R.S.	..	38	..	..	..
	Mt. St. Vincent, N. Y.	G.R.S.	..	44	..	..	..
B. & A.	Springfield, Mass.	G.R.S.	..	184	..	..	..
C. C. C. & St. L.	Lippincotts, Ohio	Union	..	..	..	17	6

Road	Location	Manufacturer	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elec. Mech.: Mech.	Elec. Mech.: Elec.
N. Y. C. & St. L.	North East, Pa.	Union	..	..	..	6	2
	Euclid, Ohio	Union	..	..	..	8	..
	Cleveland, Ohio	Union	..	4	..	2	..
N. Y. N. H. & H.	Taunton, Mass.	Union	7	..	..	..	..
	Taunton (Wales St.), Mass.	Union	9	..	..	..	..
N. & W.	Elliston, Va.	Union	..	..	23	..	..
	Walnut Cove, N. C.	Union	..	..	..	7	3
N. S.	Bonsal, N. C.	....	2	..	..	..	..
N. P.	Tacoma, Wash.	G.R.S.	..	6	..	..	..
Pac. Elec.	Clearwater, Cal.	Union	12	..	..	..	..
	Bell, Cal.	Union	19	..	..	..	..
Penna.	McDonald, Pa.	....	..	..	..	12	14
	Weirton Jct., Pa.	....	..	..	31	..	..
	Mingo Jct., Ohio	....	..	..	..	17	16
	Broadacre, Ohio	....	..	..	..	8	13
	Conesville, Ohio	....	..	..	..	8	11
	Black Run, Ohio	....	..	..	..	8	11
	Bayard, Ohio	Union	..	..	32	..	..
	Greenville, Ohio	Union	..	..	..	9	12
	Greenfield, Ind.	Union	..	..	..	4	4
	Gem, Ind.	Union	..	..	..	5	5
	Carrothers, Ohio	Union	..	..	14	..	..
	Carleton, Mich.	G.R.S.	..	28	..	..	..
	Ecorse Jct., Mich.	Union	..	27	..	..	..
	Richmond, Ind.	Union	..	..	20	..	..
	Indianapolis, Ind.	Union	..	..	..	4	5
P. M.	Carleton, Mich.	G.R.S.	..	26	..	..	..
S. A. L.	Gross, Fla.	Union	..	..	..	2	1
	Crawford, Fla.	Union	..	..	..	10	2
	Baldwin, Fla.	Union	..	11	..	..	..
	Coleman, Fla.	Union	..	..	..	9	5
	Hampton, Fla.	Union	..	..	..	14	3
	Hawthorne, Fla.	Union	..	..	..	6	3
	Drexel, Fla.	Union	8	..	..	..	..
	Taconey, Fla.	Union	8	..	..	..	..
	Ft. Myers, Fla.	Union	13	..	..	..	..
	Gilchrist, Fla.	Union	8	..	..	..	..
	Caloosahatchie R., Fla.	Union	4	..	..	..	..
	Imperial R., Fla.	Union	4	..	..	..	..
	Miami No. 1, Fla.	Union	..	4	..	..	..
	Miami No. 2, Fla.	Union	..	..	..	..	3
	Miami Canal, Fla.	Union	4	..	..	..	..
	So. Fork New R., Fla.	Union	4	..	..	..	..
	Withla, Fla.	Union	8	..	..	..	..
	Blossom, Ga.	Union	..	..	..	2	2
	Ogeechee R., Ga.	Union	..	..	..	4	2
	Altamaha R., Ga.	Union	..	..	..	4	2
	Satilla R., Ga.	Union	..	..	..	4	2
	St. Mary's R., Ga.	Union	..	..	..	4	2
	Trout Creek, Fla.	Union	..	..	..	4	2
	Jacksonville, Fla.	Union	..	..	..	3	1
	Starke, Fla.	Union	..	..	..	6	4
	Waldo, Fla.	Union	..	..	..	4	4
Southern							
G. S. & F.	Biltmore, N. C.	G.R.S.	22	..	..	..	..
	Stratton, Ga.	G.R.S.	20	..	..	..	..
	Crawford, Fla.	G.R.S.	13	..	..	..	..
	Hampton, Fla.	G.R.S.	15	..	..	..	..
A. G. S.	Wauhatchie, Tenn.	G.R.S.	..	26	..	..	..
S. P.	Opelousas, La.	Union	5	..	..	..	..
Tex. & La. Lines.	Houston 5, Tex.	Union	6	..	..	..	..
	Houston 26, Tex.	G.R.S.	..	6	..	..	..
	Harrisburg, Tex.	Union	2	..	..	..	..
	Corpus Christi, Tex.	G.R.S.	..	8	..	..	..
	Bryan, Tex.	Union	2	..	..	..	..
	Santa Clara Calif.	G.R.S.	..	48	..	..	..
T. & P.	Terrell, Tex.	G.R.S.	..	10	..	..	..
	H. & S. Xing, La.	G.R.S.	..	..	..	6	6
U. P.	Summit, Neb.	Union	..	23	..	..	..
	Bonner Springs, Kan.	Union	..	16	..	..	..
L. A. & S. L.	Badger, Cal.	G.R.S.	..	6	..	..	..
Wabash	Mexico, Mo.	Union	..	..	..	6	..
	River Rouge, Mich.	Union	..	20	..	..	..
Totals	New — Plants	142	...	...	...	...	...
	New — Levers	...	342	804	349	317	244
	Rebuilt not listed in table — Plants	115	...	...	...	...	...
	Rebuilt not listed in table — Levers	...	94	182	83	45	182

new plants, totaling 142 new interlockings, 31 automatic signaling interlockings at railroad crossings, and 163 installations of desk levers for remote power operation of outlying switches. The levers involved in these installations totaled 2,480 and in addition 586 levers were added to plants that were revised or rebuilt, thus making a total of 3,066 new levers of interlocking installed during 1927.

The bulk of the new interlocking construction consisted of comparatively small plants at junctions, crossings, yard leads, and draw bridges. Increased favor is being shown for the electro-mechanical plant in which the switches near a tower are operated by pipe connections and the signals are operated electrically. This type of system was applied at 78 new plants or additions to existing layouts during the year.

The use of remote control equipment, consisting of desk levers and electric switch machines, to operate outlying switches or to combine two or more interlocking plants, showed a marked increase in 1927, 225 desk levers and 139 switch machines having been installed for such purposes in 1927 as compared with 154 desk levers and 92 switch machines in 1926.

Increased interest was shown during 1927 in the construction of automatic interlockings, or automatic signaling protection for railroad grade crossings in lieu of interlocking that must have machines requiring levermen for operation. Thirty-one of these automatic interlockings were installed in 1927 as compared with 21 in 1926. The Chicago, Milwaukee & St. Paul completed 7 of these plants in 1927 and plans 18 more for 1928. At a crossing of the double-track main line of the Wabash and a single-track line of the New York Central, a mechanical interlocking plant was replaced by one of the automatic signaling plants, which demonstrates the extensive possibilities of this type of installation.

A total of 81 spring switches were installed on 20 roads during 1927, the majority of these installations being at the ends of double track, although a few roads are using them in yards or at the ends of passing tracks

Table E—Interlocking Plants Under Construction, December 31, 1927

Road	Location	Manufacturer	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elec. Mech.: Mech.	Elec. Mech.: Elec.
A. C. L.	Orlando, Fla.	Union	..	..	..	7	3
	Thomasville, Ga.	Union	..	..	..	11	6
	Gary, Fla.	Union	..	..	..	12	6
B. & M.	Ayer, Mass.	Union	..	..	37	..	..
	Lowell Jct., Mass.	G.R.S.	..	33	..	..	..
	Dover, N. H.	G.R.S.	..	46	..	..	..
C. R. of N. J.	Woodbridge Jct., N. J.	Union	..	..	25	..	..
C. & O.	Lockbourne, Ohio	Union	..	..	..	1	1
	Ranger, W. Va.	....	4	..	..	..	..
	Gill, W. Va.	....	4	..	..	..	..
C. & N. W.	Geldfield, Iowa	....	2	..	..	..	..
	Elkton, S. D.	....	2	..	..	..	..
C. M. & St. P.	Moline, Ill.	....	4	..	..	..	..
C. R. I. & P.	Ponca City, Okla.	....	..	..	..	6	4
	Root St., Chicago	Union	..	33	..	..	..
D. L. & W.	Hackensack Draw, N. J.	Union	..	..	17	..	..
	Boonton, N. J.	Union	..	..	17	..	..
Erie	Jersey City, N. J.	Union	..	..	24	..	..
M-K-T	Lancaster, Tex.	Union	5	..	..	..	..
M. P.	Osawatomie, Kan.	....	..	16	..	..	..
N. Y. C.	Buffalo, N. Y. (SS48)	G.R.S.	..	307	..	..	..
	Buffalo, N. Y. (SS49)	G.R.S.	..	380	..	..	..
	Rochester, N. Y.	G.R.S.	..	165	..	..	..
	Dumont, N. J.	G.R.S.	..	..	..	25	19
	Depew, N. Y.	G.R.S.	..	38	..	..	..
O. C. L.	Stanley, Ohio	G.R.S.	..	130	..	..	..
C. C. C. & St. L.	Sedamsville, Ohio	Union	..	19	..	..	..
N. Y. N. H. & H.	Springfield, Mass.	Union	..	47	..	..	..
	Conn. Riv., Conn.	Union	..	9	..	..	..
Reading	Cape May, N. J.	Union	6	..	..	..	..
Totals	New — Plants	34	...	...	...	...	...
	New — Levers	..	27	1,223	120	39	..
	Rebuilt not listed in table — Plants	49	...	...	...	...	...
	Rebuilt not listed in table — Levers	..	56	25	25	145	..

where movements in one direction on one route predominate.

Car retarders were installed at six classification yards in 1927, totaling 135 retarders, as compared with seven installations in 1926, totaling 367 retarders. The Boston & Maine provided retarders at three yards in 1927 and the New York Central and the Central of New Jersey each equipped a yard, while the Norfolk & Western completed a car retarder installation at Portsmouth, Ohio, on December 26.

Work Under Construction

At the end of the year construction was under way on a considerable number of signal and interlocking installations, especially in the southern part of the country. Thirty-five installations of automatic signaling now under way and to be completed early in 1928, total 688 miles of road.

Interlocking construction is under way on 34 new plants and 49 plants are being rebuilt, representing a total of 1,887 new interlocking levers. Remote control layouts are being constructed at 29 points, including 76 desk levers and 24 power switch machines. Automatic interlockings are under construction at 9 points. Automatic highway crossing protection is under way on several roads, totaling 32 wig-wag and 200 flashing-light signals.

Table F—Interlocking Plants Contemplated for 1928

Road	Location	Manufacturer	Working levers: Mechanical	Electrical	Electro-pneumatic	Elec.-mech.: Mech.	Elec.-mech.: Elec.
A. T. & S. F.	Augusta, Kan.		..	..	..	46	30
	Burrton, Kan.		..	17	..	..	..
	Stafford, Kan.		..	7	..	..	..
	Mayfield, Kan.		..	6	..	..	..
	Canyon, Tex.		..	2	..	..	..
C. & A.	Delavan, Ill.		24	..	..	..	..
K. C. S.	Kansas City, Mo.		..	..	..	2	..
M. K. T.	Mound Valley, Kan.	Union	15	..	..	..	..
N. Y. C.	Chicago	G.R.S.	..	41	..	..	..
	South Bend, Ind.	G.R.S.	..	157	..	..	..
O. C. L.	Fostoria, Ohio	G.R.S.	..	90	..	..	..
I. H. B.	Elsdon, Ill.		..	*	..	..	..
N. Y. C. & St. L.	Altamont, Ind.		..	32	..	..	..
	Gould, Ohio		..	50	..	..	..
Reading	Pottsville Jct., Pa.	Union	31	..	..	..	..
St. L.-S. F.	Bolige, Ala.	Union	12	..	..	..	..
	Gulfton, Mo.	Union	18	..	..	..	..
	Asbury, Mo.	Union	15	..	..	..	..
	Van Buren, Ark.	Union	34	..	..	..	..
	Liberal, Mo.	Union	25	..	..	..	..
	Nettleton, Ark.	Union	18	..	..	..	..
	Girard, Kan.	Union	20	..	..	..	..
	Mound Valley, Kan.	Union	15	..	..	..	..
	Hoxie, Ark.		..	..	..	..	..
	Augusta, Kan.		..	..	..	..	..
	Holly Springs, Miss.		..	..	..	..	..
	Randolph, Okla.		..	..	..	..	..
S. P.	Harlingen, Tex.	Union	18	..	..	..	..
U. P.	Topeka, Kan.		..	75	..	..	..
	Manhattan, Kan.		..	39	..	..	..
Wabash	Decatur, Ill.	Union	..	5	..	..	..
Totals	New—Plants 61		..	..	..	..	..
	New—Levers		245	521	..	48	30
	Rebuilt, not listed in table—Plants 27		..	..	..	..	..
	Rebuilt, not listed in table—Levers		64	20	5	9	18

Good Prospects for 1928

Eighteen roads have already decided definitely on their signaling programs for 1928. Their reports of work contemplated include automatic signals on 1,237 miles of single and 847 miles of double track, totaling 2,088 miles of road, which is slightly larger than the mileage in evidence at this time last year.

More than 61 new interlockings are planned for 1928 and 27 plants are to be rebuilt, requiring 848 levers at new plants and 111 additional levers at old plants. Forty-three automatic interlockings are planned. Remote control layouts are contemplated at 19 locations, requiring 59 levers and 63 power switch machines. All of these totals for proposed interlocking construction for 1928 are over 100 per cent in excess of the items reported as contemplated a year ago.

Many roads have not as yet completed their budget programs for signaling in 1928. Therefore, a considerable volume of construction not reported at this time will be completed in the coming year. The roads report good prospects for expenditures for signaling projects and, therefore, it is believed that construction for 1928 will equal if not exceed that for 1927.

Table G—Automatic Interlocking Construction

Road	Number of plants: Completed in 1927	Under construction	Contemplated for 1928
B. & M.	1	..	..
C. N.	3	..	..
C. P.	1	..	..
C. & E. I.	..	1	..
C. & N. W.	3	..	..
C. G. W.	1	..	..
C. M. & St. P.	7	3	18
C. R. I. & P.	2	3	..
C. R. I. & P.	2	3	..
I. C.	1	..	..
K. C. S.	..	..	5
M. St. P. & S. S. M.	2	..	..
M. P.	1	..	..
N. Y. C.	1	..	2
N. Y. C. & St. L.	..	..	2
N. Y. N. H. & H.	..	1	..
N. P.	1	..	..
S. P.	..	..	1
St. L.-S. F.	..	1	9
T. & P.	2	..	..
Wab.	2	..	3
Total	31	9	43

Train Control in 1927

The two feature activities of the field of automatic train control in 1927 were the extensive installation of the code system on the Pennsylvania, and the voluntary extensions of installations on several roads beyond the territories listed in the Interstate Commerce Commission's orders.

In brief, the first order of the commission issued in June, 1922, requires train stop or train control on one engine division on 44 lines, totaling 4,322 miles of road and 7,647 track miles, with 3,893 locomotives. A year ago, on January 1, 1927, the installations under the first

Table H—Spring Switches Installed During 1927

Road	Number spring switches
A. T. & S. F.	15
B. & O.	5
C. N.	3
C. R. N. J.	1
C. & E. I.	1
C. & N. W.	2
C. B. & Q.	4
C. M. & St. P.	2
C. R. I. & P.	8
C. S. S. & S. B.	4
I. C.	4
M. P.	10
S. A. L.	1
Sou.	11
A. G. S.	1
C. N. O. & T. P.	3
S. P.:	
L. & T. Lines	1
T. & P.	3
W. & L. E.	2
Total	81

Table I—Car Retarder Installation Completed During 1927

Road	Location	No. of classification tracks	No. of towers	No. of retarders	Rail ft. retarders	No. of power switches	No. of switch signals	No. of power skates	Manufacturer
B. & M.	Boston, Mass.	29	2	16	1,232	28	..	0	Union
B. & M.	Boston, Mass.	30	2	15	1,100	30	..	0	Union
B. & M.	Mechanicsville, N. Y.	36	2	17	1,287	35	35	0	G.R.S.
C. R. N. J.	Allentown, Pa.	24	3	20	1,305⅓	23	..	24	Union
N. Y. C.	Selkirk, N. Y.	25	3	33	2,194⅓	25	25	12	G.R.S.
N. & W.	Portsmouth, O.	36	3	34	2,053⅓	44	44	37	Union
Totals		180	15	135	9,171	185	185	73	

order were completed on all but five roads, on which construction was continued actively during the early part of 1927, so that all installations under the first order were completed and in service prior to July 1, 1927, with the exception of the Chicago & Alton, which is nearly finished.

The second order, issued in January, 1924, requires a second division to be equipped on 36 of these roads, totaling 4,075 miles of road, 7,539 miles of track and 3,060 locomotives. Of the 15 installations under the second order not completed a year ago, 7 were in service prior to July 1, and four others were finished prior to December 31. The Reading expects to complete its installation by May 1, 1928, and the New York, New Haven & Hartford by June 30. The Delaware, Lackawanna & Western expects to comply with its work by July 1, 1928.

Table J—Automatic Highway Crossing Protection

Road	Installed in 1927		Under construction		Contemplated for 1928	
	Wig-Wag	Flashing light	Wig-Wag	Flashing light	Wig-Wag	Flashing light
A. T. & S. F.	72	..	7	..	40	14*
B. & O.	173	..	..	..	..	..
Ban. & Ar.	2	..	..	..	..	..
B. & M.	..	14	..	8	..	..
B. R. & P.	..	12	..	..	..	6
C. N.	20	2	..	..	10	..
G. T.	..	60	..	..	..	..
C. P.	11	1	..	..	..	..
C. R. N. J.	..	30	..	..	..	..
C. & O.	..	44	..	..	..	..
C. & A.	1	2	..	..	..	..
C. & E. I.	..	14	..	4	..	6
C. & N. W.	125	2	..	..	..	..
C. G. W.	..	3	..	2	..	1
C. I. & L.	..	12	..	..	..	12
C. M. & St. P.	61	9	..	..	..	..
C. R. I. & P.	..	35	..	..	..	..
C. St. P. M. & O.	2	..	..	..	..	..
C. S. S. & S. B.	1	10	..	..	..	..
C. B. & Q.	15	12	..	..	..	..
D. L. & W.	..	19	..	3	..	..
D. & R. G. W.	..	4	..	..	..	..
D. T. & I.	..	16	..	..	..	..
E. J. & E.	..	16	..	..	..	..
Erie	4	89	..	..	10	100
H. V.	..	10	..	..	..	7
I. C.	..	95	..	36	..	..
G. & S. I.	..	2	..	..	..	..
Y. & M. V.	..	12	..	..	..	..
K. C. S.	2	..	..	..	3	..
L. V.	..	16	..	..	..	..
L. & N.	6	42	..	36	..	..
L. I.	..	42	..	19	..	14
M. K. T.	10	..	..	..	21	..
M. P.	40	..	..	..	..	..
N. C. & St. L.	22	5	..	..	..	..
N. Y. C.	..	108	..	5	..	22
B. & A.	..	4	..	..	..	..
C. C. C. & St. L.	..	4	..	..	..	..
M. C.	1	110	..	..	..	..
O. C. L.	..	10	..	17	..	8
P. & E.	..	4	..	..	..	22
N. Y. C. & St. L.	..	74	..	19	..	46
N. Y. N. H. & H.	..	23	..	3	..	19
N. & W.	9	1	..	..	..	..
N. O. P. & L.	..	7	..	..	..	..
N. P.	41	..	18	..	..	..
Pac. Elec.	41	..	..	..	..	..
Penna.	..	155	..	19	..	..
P. M.	..	85	..	..	..	12
Reading	..	124	..	22	..	59
St. L.-S. F.	4	..	7	..	2	..
S. A. L.	..	24	..	..	..	..
Southern	..	16	..	4	..	..
A. G. S.	..	3	..	..	..	..
C. N. O. & T. P.	..	1	..	3	..	..
N. O. & N. E.	..	1	..	..	..	..
S. F.						
L. & T. Lines	28	..	..	..	..	..
Pac. Sys.	22	..	..	..	..	..
T. & P.	10	..	..	..	..	..
U. P.	17	..	..	..	32	..
L. A. & S. L.	24	..	..	..	5	..
O. S. L.	..	..	..	..	15	..
St. J. & G. I.	2	..	..	..	14	..
Wab.	..	26	..	..	..	28
W. & L. E.	7	2	..	..	..	..
Totals	773	1,412	32	200	152	376

The activities of the Interstate Commerce Commission during 1927 with respect to train control have been devoted to inspections of completed installations.

During the latter part of 1926, the code system of train stop was developed by the Union Switch & Signal Company, and the Pennsylvania proceeded to use this new system on the West Jersey & Sea Shore, on two divisions of the Pittsburgh, Cincinnati, Chicago & St. Louis, and on one division of the Pennsylvania, all of which were completed before July 1, 1927. The Central of New Jersey, the New Haven and the Reading also adopted this new equipment during the year.

The Chicago, Indianapolis & Louisville equipped its first division with the intermittent train stop system of the Sprague Safety Control and Signal Corporation. However, after the installation had been inspected by the commission and approved, this road decided to replace it with the Miller type intermittent train stop as manufactured by the General Railway Signal Company, the same type being used also on the second district; and both installations were completed December 1.

Several Roads Extend Installation Voluntarily

Four roads have made extensive installations of train stop or train control beyond the territories specified by the orders of the commission. To meet the requirements of the two orders on the Cincinnati, New Orleans & Texas Pacific, and the Southern, the Southern Railway system installed train stop on 636 miles of road with 283 engines equipped and has also voluntarily provided train stop protection on an additional 2,051 miles, with 597 locomotives, therefore the Southern now has a total of 2,687 miles of road and 880 locomotives equipped with train stop.

The New York Central equipped 327 road miles with train stop to meet the orders of the commission, including territory from Albany, N. Y. to Syracuse and Buffalo, N. Y., to Cleveland, Ohio, a total of 839 engines being equipped for operation on this territory. The same type of installation is being extended over the remainder of the through New York to Chicago route which will total with one branch 978 miles of road.

The Michigan Central equipped 190 road miles from Detroit, Mich., to Niles, to meet the requirements of the two orders of the commission and has also extended the installation from Niles to Kensington, Ill. (Chicago), a distance of 78 miles and equipped 48 additional locomotives, thus completing the installation from Detroit to Chicago. The Chicago & North Western's first two installations of train control covered the territory from Council Bluffs, Ia., to Clinton, 350 road miles, and during 1927 the system was extended 138 road miles from Clinton to Chicago, thus completing the route from Chicago to Omaha, 487 road miles.

It is evident, therefore, that the train control situation in general has not changed materially during 1927. The orders of the commission have been complied with and fulfill their evident purpose, i.e., the extensive development of automatic train control. Now that the equipment is in service, a few years should be allowed to accumulate data as to the benefits to be derived and to ascertain if the expense for train control is justified.

On those roads using the cab signal, it is quite evident that this addition is a decided benefit. The use of train control, with speed control, to permit trains to pass intermediate automatic signals indicating stop, without stopping, at speeds under 20 miles an hour, is the means of accomplishing marked economies. The Chicago, Rock Island & Pacific, which uses semaphore signals with its train control, is taking advantage of this feature. This result is in effect accomplished on the Illinois Central and the Santa Fe as no between-stations wayside signals are used. The Chicago & North Western is now removing the wayside automatic signals on its 356 miles of double-track control territory from Council Bluffs, Ia., to Clinton.

Railway Equipment Prices

Cars and locomotives now cost on a per-pound basis about double pre-war figures—Comparison given by index numbers

By Charles W. Foss

Financial Editor, *Railway Age*

AS this issue of the *Railway Age* goes to press, the latest complete published data on the prices of railway cars and locomotives are the figures compiled by the Presidents' Conference Committee on Federal Valuation and contained in the so-called equipment factors statement. The latest statement, recently issued, shows the price trends of railway equipment for the years 1910 to 1926. The figures are presented in the form of the percentage increase in price over the average prices of each class of equipment in the base years 1910 to 1914. The computations are of the weighted average price per pound and therefore are not affected by the complications due to the inclusion of the greater number and variety of accessories and specialties in more recent years. The official character of the information given is indicated by the fact that it is based on the total selling price of the entire output of two large locomotive companies and six large car companies with certain sales excluded such as the Pershing locomotives sent to France with the A. E. F. during the war and such as locomotives and cars sold to foreign countries.

The record, which is reproduced here in the form of a table and chart, shows, generally speaking, that the prices of railway equipment on a per pound basis averaged in 1926 approximately double the prices ruling before the World War. In the case of the locomotives and all-steel freight cars, the prices in 1926 were slightly above those of 1925, but the prices of freight cars of composite construction and of passenger-train cars were about the same as in 1925. A summary of the 1926 average equipment price situation follows:

Average Equipment Prices in 1926 and 1925

(Expressed in percentage of average prices 1910 to 1914)

	1926	1925
Locomotives	230	208
Freight cars, all-steel	184	169
Freight cars, composite construction	196	195
Passenger train cars, all-steel	201	201

The index number of locomotive prices shows for 1926 both the greatest increase over 1925 and also over the base years 1910-1914 of any of the index numbers. The passenger-train car price index shows the next greatest increase over the base years, but no increase over 1925. The index price of all-steel freight cars shows a substantial increase in 1926 over 1925, but, on the other hand, shows the smallest increase of any of the classes of equipment over the prices ruling in the 1910-1914 base years.

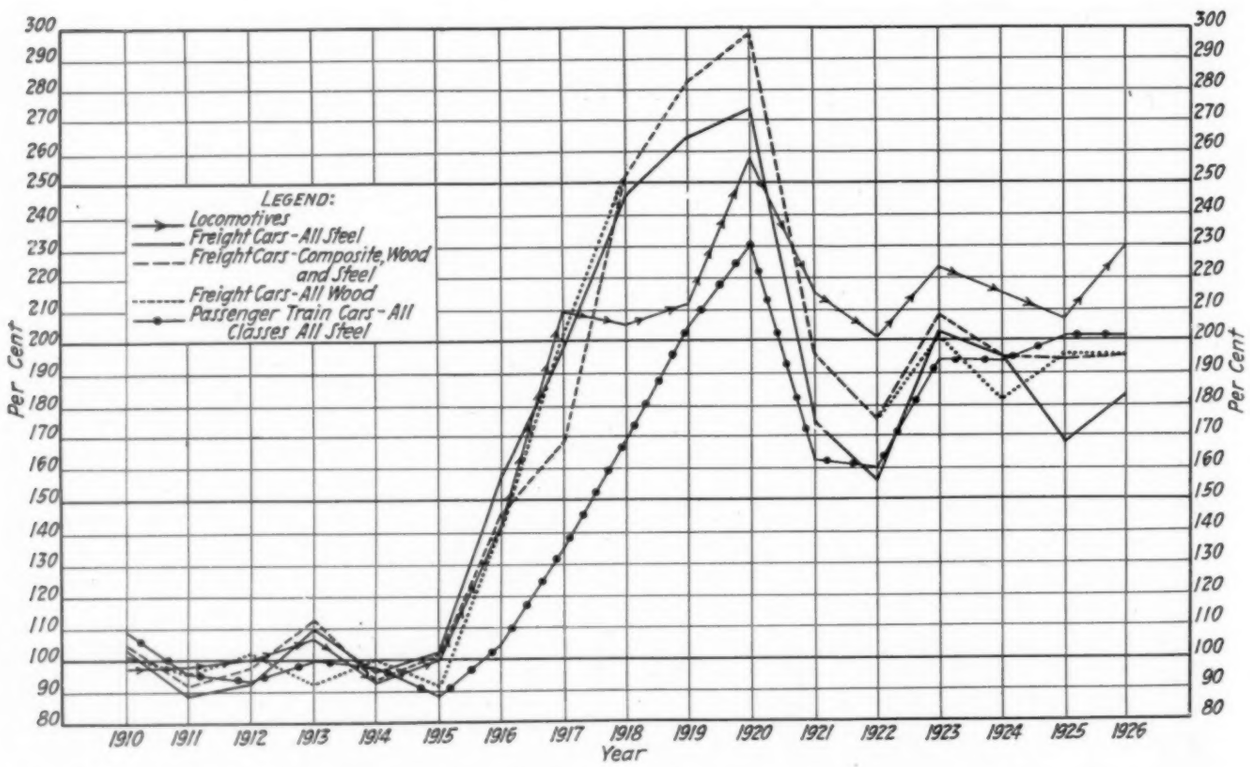


Chart used by Courtesy of Eastern Group, Presidents' Conference Committee on Federal Valuation

Diagram Showing Relation of Prices in Per Cent for Various Classes of Equipment, 1910 to 1926

Railway Equipment Factors

STATEMENT SHOWING THE NUMBER OF UNITS SOLD, THE WEIGHTED AVERAGE PRICE PER POUND AS SOLD (EXCEPT WHERE ESTIMATED, SEE NOTE No. 4) AND THE PER CENT OF INCREASE IN PRICE

Year or period	Locomotives			Freight Cars: All Steel			Freight Cars: Composite Wood and Steel			Freight Cars: All Wood			All steel Passenger train cars (Steel underframe and all wood cars —See note 4-d)	
	No. of locos.	Price per lb.	Per cent	No. of cars	Price per lb.	Per cent	No. of cars	Price per lb.	Per cent	No. of cars	Price per lb.	Per cent	No. of cars	Per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1910-1914, incl. base	10,583	7.385c	100	71,108	2.57c	100	148,047	2.51c	100	53,349	2.26c	100	4,116	100
1910	2,901	7.265	98	10,455	2.68	104	18,555	2.63	105	13,739	2.30	102	799	109
1911	1,608	7.255	98	13,850	2.30	89	32,918	2.31	92	13,720	2.17	96	508	96
1912	3,269	7.350	100	17,803	2.39	93	46,348	2.47	98	17,665	2.31	102	821	94
1913	2,066	8.890	107	22,598	2.83	110	25,898	2.84	113	2,600	2.11	93	1,212	100
1914	739	6.873	93	6,402	2.49	97	24,328	2.37	94	5,625	2.25	100	776	98
1915	981	7.413	100	13,050	2.63	102	24,752	2.54	101	4,350	2.11	93	396	89
1916	2,170	10.542	143	21,307	4.01	156	14,650	3.67	146	12,396	3.19	141	687	105
1917	1,586	15.513	210	4,750	5.11	199	14,500	4.25	169	3,200	4.54	201	548	135
1918	1,976	15.225	206	12,383	6.36	247	43,000	6.35	253	None	*5.72*	*253*	16	169
1919	273	15.637	212	None	*6.82*	*265*	None	*7.09*	*282*	None	*6.37*	*282*	31	205
1920	1,458	19.074	258	13,480	7.03	274	12,950	7.47	298	None	*6.73*	*298*	553	231
1921	326	15.923	216	4,200	4.50	175	12,450	4.94	197	None	*4.45*	*197*	47	163
1922	1,910	14.924	202	32,181	4.00	156	51,597	4.39	175	None	*3.96*	*175*	1,182	160
1923	1,726	16.551	224	19,875	5.21	203	26,140	5.24	209	4,800	4.54	201	407	194
1924	1,109	15.919	216	46,433	5.05	196	26,360	4.92	196	3,795	4.12	182	862	194
1925	816	15.326	208	20,776	4.34	169	24,090	4.90	195	600	4.42	196	842	201
1926	960	16.999	230	6,825	4.73	184	15,146	4.93	196	None	*4.43*	*196*	697	201

NOTES—(1) The data on rolling equipment is based on the total selling price of the entire output of two large locomotive and six large car companies with certain sales excluded such as the Pershing locomotives and locomotives and cars sold to foreign countries.

(3) The price per pound is a weighted average composite price of all classes of equipment coming under each of the general headings.

(4) All prices and percentages shown in above table were determined from actual data furnished by the manufacturers with the exception of those in italics which were estimated in the following manner:—

(a) ALL STEEL FREIGHT CARS. COMPOSITE FREIGHT CARS—Price and percentage for 1919 were derived by interpolating between actual prices reported for 1918 and 1920 (1st 6 mos.).

(b) ALL WOOD FREIGHT CARS—The percentages for composite cars were used and from these percentages the price per pound was calculated using the weighted average price of all wood freight cars for 1910 to 1914, incl., as base, or 100 per cent.

(c) ALL STEEL PASSENGER TRAIN CARS, FLOATING EQUIPMENT—Derived by interpolating between "Trend of Price" factors shown in Equipment Committee's reports (Passenger Train Car Report, dated June 1, 1921, and Supplements).

(d) WOOD WITH STEEL UNDERFRAME AND ALL WOOD PASSENGER TRAIN CARS—No sales reported (except seven for steel underframe) 1915 to 1926, incl. If sufficient wooden cars had been sold to make the market, it is felt that the increase in price over the weighted average price 1910 to 1914, incl., would have been at least as great as that for all steel cars; therefore the percentage factors shown for all steel passenger train cars (Col. 15) are recommended for application to the wood with steel underframe and all wood passenger train cars.

The price figures that are available to show the trend in 1927 are of a different character and are not readily comparable with those issued by the Presidents' Conference Committee. They are given in the form of the total approximate cost of each unit as reported to the Bureau of Finance of the Interstate Commerce Commission in the applications for approval of issues of equipment trust certificates. They have great value in that they give people desiring such information an adequate idea of how much a railroad has to spend for the new larger and more efficient units of equipment that it is now their practice to install.

Inasmuch as the index numbers compiled by the Presidents' Conference Committee are on a per-pound basis

Locomotive Prices in 1927

(See explanatory note in text)

Road	No.	Type	Weight	Tractive force	Builder	Unit price	Date of order	Equipment trust series
Baltimore & Ohio	19	4-6-2	326,000	50,000	Baldwin	$69,500	Nov., 1926	E
	1	4-6-2	326,000	50,000	Baldwin	70,040	Nov., 1926	E
Central of New Jersey	5	4-6-2	327,500	46,920	Baldwin	74,025	May, 1927	1926
	10	0-8-0	255,100	61,422	Baldwin	47,585	May, 1927	1926
Chicago, Rock Island & Pacific	7	2-8-2	347,000	63,466	American	68,209	Mar., 1926	O
	3	2-8-2	351,000	63,466	American			
	5	4-8-2	365,000	50,430	American	68,423	Mar., 1926	O
	25	2-8-2	351,000	66,570	American	76,597	Dec., 1926	O
	10	4-8-2	365,000	50,400	American	72,681	Dec., 1926	O
Denver & Rio Grande Western	10	2-8-8-2	644,000	131,800	American	120,901	Feb., 1927	C
Erie	25	2-8-4	443,000	71,000	American	100,200	July, 1927	NN
	25	2-8-4	457,500	72,000	Lima			
	30	0-8-0	230,210	57,210	Baldwin	55,800	July, 1927	NN
	2	Oil-Elec.	130,000	40,000	Ing. Rand.-Am. Gen. El.	100,200	Sept., 1927	NN
Illinois Central	15	0-8-0	221,400	51,041	Baldwin	47,505	June, 1927	O
International-Great Northern	5	0-8-0	230,500	57,750	American	43,285	Jan., 1927	B
	5	2-8-2	.....	.....	.....	Est. 97,400	.....	B
Lehigh & New England	2	2-10-0	399,200	90,000	Baldwin	76,030	July, 1927	F
	3	0-8-0	269,800	68,500	Baldwin	45,250	July, 1927	F
	3	0-8-0	205,760	50,000	Baldwin			
Mobile & Ohio	5	0-6-0	165,000	39,100	American	36,700	Jan., 1927	P
New Orleans, Texas & Mexico	5	0-8-0	230,500	57,750	American	43,020	Jan., 1927	C
	6	4-6-2	302,000	43,970	American	66,217	Jan., 1927	C
New York, New Haven & Hartford	1	0-8-0	245,000	60,600	American	57,658	Mar., 1927	1926
	5	0-8-0	245,000	60,600	American	57,561	Mar., 1927	1927, No. 2
	10	4-8-2	374,000	71,150	American	98,345	Jan., 1927	1927, No. 2
	5	A.C.-D.C. Elec.	362,000	52,500	Westinghouse	144,800	May, 1927	1927, No. 2
Norfolk Southern	3	2-8-0	165,000	39,100	Baldwin	41,000	Nov., 1926	F
Seaboard Air Line	25	0-6-0	180,000	45,000	Baldwin	40,100	Nov., 1926	AA
Southern Pacific	10	4-10-2	445,000	84,200	American	96,796	March, 1927	J
	2	4-8-2	368,000	57,510	Company shops	86,460	Jan., 1927	J
Texas & Pacific	15	2-10-4	448,000	84,600	Lima	107,120	March, 1927	JJ
	3	0-8-0	230,500	54,500	Baldwin	58,070	March, 1927	JJ
	2	0-8-0	232,800	54,500	Baldwin	70,772	March, 1927	JJ
Western Maryland	20	2-10-0	400,000	90,000	Baldwin	83,500	Nov., 1926	E

comparison with previous years is facilitated. In making comparisons of the 1927 approximate total cost figures, with those of previous years, however, one must keep in mind that the more recently built equipment is in large part built to meet new requirements of efficiency, whereby a greater volume of tonnage can be handled with the same number of equipment units or the same volume of tonnage with a smaller number of the new larger and more efficient units than were required when cars or locomotives were smaller and generally of less productive worth.

The tables of prices of locomotives, freight cars and passenger cars are given in the usual form. They include only such equipment as has been financed through issues of equipment trust certificates which were approved during 1927 by the Interstate Commerce Commission. In its application for approval of such issues a carrier is required to supply information regarding the equipment to be purchased with the proceeds of the financing. This information includes the prices of the individual car or locomotive units and is made public by the commission in the report in which its approval of the certificates is announced and copies of which are distributed to the press and to all interested parties.

In the tabulation are included the name of the road, the number of units of equipment purchased, details concerning the type and size, the approximate price of each unit, the name of the builder, the date of the order and the identification of the equipment trust series by which the purchase of the equipment has been financed. The name of the purchaser, the number of units of each type, the approximate prices and the identification of the equipment trust series are obtained from the Interstate Commerce Commission finance dockets mentioned above. The other material has been supplied by the *Railway Age* from its own equipment tabulation.

Explanatory Note.—The data are given in some detail so that the varying prices may be reconciled with the varying sizes and character of the equipment. It is, of course, impossible in the small space available to explain these variations in full, and there may be some

Freight Car Prices in 1927

(See explanatory note in text)

Road	No.	Type	Capacity	Construction	Builder	Unit price	Date of order	Equipment trust series
Baltimore & Ohio	1,000	Hopper	70-ton	Steel		$2,313		E
	1,000	Hopper	70-ton	Steel	Baltimore Car	2,294	Jan., 1927	E
	1,000	Hopper	70-ton	Steel	Bethlehem Steel			
	500	Box	50-ton	Steel		1,856		E
	500	Box	50-ton	Steel	Am. Car & Fdy	1,934	Jan., 1927	E
	500	Box	50-ton	Steel	Pressed Steel			
Chicago & Illinois Midland	350	Gondola	70-ton	Steel	Pullman	2,342	June, 1927	....
Chicago & North Western	150	Ore	75-ton	Steel	Pullman	2,286	Jan., 1926	1925, R
	250	Ore	70-ton	Steel	Pullman	2,318	Dec., 1926	1925, R
	250	Ballast	50-ton	.....		2,327		1925, R
	100	Flat	50-ton	.....	Bettendorf	1,823	Nov., 1926	1925, R
	500	Stock	40-ton	Steel Frame	Ill. Car & Mfg.	1,713	Sept., 1926	1925, R
	500	Hopper	70-ton	Steel	Pressed Steel	2,516	Feb., 1927	1925, S
Chicago, Rock Island & Pacific	500	Box	40-ton	Steel Frame	Bettendorf	2,163	Jan., 1927	O
	500	Box	40-ton	Steel Frame	Am. Car & Fdy			
	500	Automobile	40-ton	Steel Frame	Standard Steel	2,558	Jan., 1927	O
	500	Coal	50-ton	Steel Frame	Bettendorf	2,244	Jan., 1927	O
	250	Ballast	50-ton	Steel Frame	Pressed Steel	2,269	Jan., 1927	O
	250	Flat	50-ton	Steel Frame	Ryan	1,710	Jan., 1927	O
Chi., St. Paul, Minneapolis & Omaha	500	Box	50-ton	Steel Frame	Standard Steel	2,230	July, 1927	1917, D
Denver & Rio Grande Western	300	Automobile	50-ton	St. Und'frame	Mt. Vernon	2,397	Apr., 1927	C
Illinois Central	500	Auto furn.	40-ton	St. Und'frame	500 Pressed Steel	2,433	June, 1927	O
	500	Auto furn.	40-ton	St. Und'frame	and 500 Gen.-Amer.	2,462	June, 1927	O
	300	Hopper	70-ton	Steel	Pullman	2,477	June, 1927	O
	500	Flat	50-ton	St. Und'frame	Bettendorf	1,763	June, 1927	O
	500	Gondola	50-ton	St. Und'frame	500 Ill. Car and	2,370	June, 1927	O
	500	Gondola	50-ton	St. Und'frame	500 Am. Car & Fdy	2,371	June, 1927	O
	500	Box	40-ton	St. Und'frame	500 Mt. Vernon	2,309	June, 1927	O
	500	Box	40-ton	St. Und'frame	and 500 Pullman	2,333	June, 1927	O
	700	Hopper	50-ton	Steel	Standard Steel	2,094	June, 1927	O
International-Great Northern	400	Box	40-ton	St. Frame	Am. Car & Fdy.	1,981	Jan., 1927	B
	100	Box	40-ton	St. Frame	Am. Car & Fdy.	1,978	Jan., 1927	B
	100	Gondola	50-ton	St. Frame	Mt. Vernon	2,069	Jan., 1927	B
Lehigh & New England	200	Box	50-ton	Steel	Pressed Steel	2,282	July, 1927	F
Mobile & Ohio	250	Flat	50-ton	St. Und'frame	Chickasaw	1,395	Jan., 1927	P
	250	Gondola	50-ton	St. Und'frame	Chickasaw	1,760	Jan., 1927	P
	200	Hopper	50-ton	St. Frame	Chickasaw	1,540	Jan., 1927	P
	15	Dump	40-ton	Steel	Koppel	2,791	Jan., 1927	P
New Orleans, Texas & Mexico	20	Caboose	30-ton	St. Und'frame	Mt. Vernon	2,656	Jan., 1927	C
	100	Ballast	50-ton	St. Frame	Am. Car & Fdy.	2,396	Jan., 1927	C
New York, New Haven & Hartford	20	Dump	50-ton	Steel	Clark Car	4,140	Mar., 1927	1926
	4,766	Box	30-ton	St. Und'frame	Rebuilt	1,500		1927
	25	Caboose	.....	St. Und'frame	Company shops	2,380	Jan., 1927	1927, No. 2
	4	Caboose	.....	Steel	Osgood-Bradley	8,644	June, 1927	1927, No. 2
	2,250	Box	30-ton	St. Und'frame	Rebuilt	1,320		1927, No. 2
	400	Box	40-ton	St. Frame	Rebuilt	1,400		1927, No. 2
Norfolk Southern	150	Gondola	50-ton	Composite	Va. Br. & Iron	1,915	Nov., 1926	F
Pere Marquette	1,000	Box	40-ton	St. Und'frame	Pressed Steel	2,201	Apr., 1927	A
	250	Gondola	55-ton	Composite	Ill. Car & Mfg.	2,156	Apr., 1927	A
	250	Hopper	70-ton	Steel	Standard Steel	2,359	Apr., 1927	A
	20	Dump	50-ton	Steel	Koppel	4,525	Mar., 1927	A
Southern Pacific	500	Box	50-ton	St. Frame	Company shops	2,266	Jan., 1927 and	J
	500	Box	50-ton	St. Frame	Company shops	2,350	Apr., 1927	J
	1,000	Gondola	50-ton	Steel	Standard Steel	2,059	Mar., 1927	J
	200	Tank	50-ton	Steel	Gen. Amer. Tank	2,362	Mar., 1927	J
	150	Flat	50-ton	Steel	Company shops	1,716	Jan., 1927	J
	100	Flat	50-ton	Steel	Company shops	1,930	Jan., 1927	J
	30	Caboose	.....	St. Frame	Company shops	2,832	Jan., 1927	J
	10	Dump	50-ton	Steel	Clark Car	3,192	Apr., 1927	J
Wabash	500	Automobile	40-ton	St. Und'frame	Am. Car & Fdy	2,155	Feb., 1927	G
	500	Automobile	40-ton	St. Und'frame	and Standard Steel	2,147	Feb., 1927	G

Passenger Car Prices in 1927

(See explanatory note in text)

Road	No.	Class	Length	Weight	Builder	Unit price	Date of order	Equipment trust series
Baltimore & Ohio	5	Dining	.....	.....	.....	$51,600	.....	E
	50	Coaches	.....	.....	Pullman	28,180	Mar., 1927	E
	15	Pass. & Bagg.	.....	.....	Standard Steel	24,674	Mar., 1927	E
	5	Bagg. & Mail	.....	.....	Am. Car & Fdy.	27,646	Mar., 1927	E
	10	Bagg. & Mail	.....	.....	Am. Car & Fdy.	26,731	Mar., 1927	E
	15	Baggage	.....	.....	Standard Steel	21,700	Mar., 1927	E
Central of New Jersey	25	Coaches	73 ft.	119,000	Bethlehem Ship	23,808	May, 1927	1926
Chicago & Illinois Midland	3	Coaches	70 ft.	.....	Pullman	28,399	May, 1927	....
	2	Bagg. & Mail	70 ft.	.....	Pullman	22,197	May, 1927	....
	1	Pass. & Bagg.	70 ft.	.....	Pullman	25,932	May, 1927	....
Chicago & North Western	2	Bagg. & Dorm.	70 ft.	120,300	Am. Car & Fdy.	33,397	Sept., 1926	1925, R
	8	Baggage	72 ft.	.....	Pullman	19,376	Nov., 1926	1925, S
	3	Pass. & Bagg.	70 ft.	136,700	Am. Car & Fdy.	27,086	Nov., 1926	1925, S
	40	Suburban	79 ft.	100,000	Pullman, Standard Steel and Am. Car & Fdy.	23,342	Jan., 1927	1925, S
	20	Suburban	79 ft.	100,000		23,341	Jan., 1927	1925, S
	17	Suburban	79 ft.	100,000		23,386	Jan., 1927	1925, S
	4	Dining	82 ft.	.....	Pullman	50,074	Sept., 1926	1925, S
Chciago, Rock Island & Pacific	5	Baggage	70 ft.	132,300	Am. Car & Fdy.	20,517	Mar., 1926	O
	5	Dining	80½ ft.	.....	Pullman	51,593	Jan., 1927	O
	10	Coaches	74½ ft.	.....	Pullman	28,684	Jan., 1927	O
	40	Sub. Coaches	70 ft.	.....	Standard Steel	20,386	Jan., 1927	O
	4	Pass. & Bagg.	70 ft.	.....	Am. Car & Fdy.	25,374	Jan., 1927	O
	4	Bagg. & Mail	70½ ft.	.....	Am. Car & Fdy.	23,598	Jan., 1927	O
	10	Baggage	70½ ft.	.....	Am. Car & Fdy.	19,276	Jan., 1927	O
	5	Gas-electric	.....	.....	.....	42,670	.....	O
Denver & Rio Grande Western	4	Dining	.....	.....	Am. Car & Fdy.	43,846	Dec., 1926	C
Erie	4	Dining	80 ft.	169,100	Pullman	42,600	July, 1927	NN
	25	Sub. Coaches	.....	.....	Standard Steel	21,000	July, 1927	NN
	25	Express	.....	.....	Standard Steel	20,600	July, 1927	NN
Illinois Central	6	Bagg. & Mail	.....	143,600	Am. Car & Fdy.	24,681	June, 1927	O
	10	Bagg. & Exp.	.....	135,300	St. Louis Car	20,692	June, 1927	O
International-Great Northern	2	Dining	82 ft.	158,100	Pullman	42,620	Jan., 1927	B
	6	Coaches	79 ft.	144,200	Pullman	26,887	Jan., 1927	B
	2	Baggage	74 ft.	136,200	Am. Car & Fdy.	18,464	Jan., 1927	B
	4	Chair	79 ft.	147,300	Am. Car & Fdy.	28,879	Jan., 1927	B
Lehigh & New England	1	Gas-electric	.....	94,000	J. G. Brill Co.	41,361	.....	F
Long Island	97	Coaches	64½ ft.	80,700	Am. Car & Fdy.	17,125	Apr., 1927	I
	20	Coaches	64½ ft.	80,700	Am. Car & Fdy.	16,870	Apr., 1927	I
	12	Coaches	63½ ft.	79,000	Am. Car & Fdy.	15,330	Nov., 1926	I
	8	Coaches	63½ ft.	79,000	Am. Car & Fdy.	16,327	Nov., 1926	I
	60	Elec. Pass.	.....	.....	Am. Car & Fdy.	32,921	Nov., 1926	I
	30	Trailer	.....	.....	Am. Car & Fdy.	16,674	Nov., 1926	I
	10	Pass. & Bagg.	64½ ft.	78,500	Am. Car & Fdy.	15,630	Apr., 1927	I
	4	Pass. & Bagg.	63½ ft.	97,800	Am. Car & Fdy.	20,326	Nov., 1926	I
Mobile & Ohio	4	Coaches	69 ft.	139,500	Pullman	25,575	Jan., 1927	P
	2	Coaches	69 ft.	139,500	Pullman	26,100	Jan., 1927	P
	6	Bagg. & Exp.	60 ft.	114,000	Am. Car & Fry.	16,400	Jan., 1927	P
	1	Bagg. & Mail	60 ft.	117,200	Am. Car & Fdy.	20,835	Jan., 1927	P
	3	Gas-electric	.....	.....	Electro-Motive	48,333	.....	P
	2	Trailers	57½ ft.	59,920	J. G. Brill Co.	16,700	Jan., 1927	P
New Orleans, Texas & Mexico	4	Baggage	74 ft.	136,200	Am. Car & Fdy.	18,464	Jan., 1927	C
	6	Chair	79 ft.	147,300	Am. Car & Fdy.	28,879	Jan., 1927	C
	2	Bagg. & Mail	74 ft.	141,600	St. Louis Car	22,346	Jan., 1927	C
New York, New Haven & Hartford	6	Gas-electric	.....	103,880	J. G. Brill Co.	45,746	.....	1926
	20	Baggage	70 ft.	60,000	Osgood-Bradley	20,056	May, 1927	1927, No. 2
	25	Milk	.....	48,000	Company shops	2,600	Aug., 1927	1927, No. 2
Southern Pacific	10	Coaches	80½ ft.	.....	Standard Steel	33,171	Mar., 1927	J
	6	Coaches	80½ ft.	.....	Standard Steel	30,801	Mar., 1927	J
	4	Coaches	80½ ft.	.....	Standard Steel	27,866	Mar., 1927	J
	5	Compt. Coaches	80½ ft.	.....	Standard Steel	31,492	Mar., 1927	J
	5	Compt. Coaches	80½ ft.	.....	Standard Steel	32,305	Mar., 1927	J
	5	Int. Coaches	80½ ft.	.....	Standard Steel	28,694	Mar., 1927	J
	10	Baggage	73 ft.	124,200	Bethlehem Ship	20,790	Mar., 1927	J
	20	Baggage	73 ft.	125,600	Bethlehem Ship	20,890	Mar., 1927	J
	5	Bagg. & Mail	73 ft.	131,900	Bethlehem Ship	25,296	Mar., 1927	J
	5	Bagg.-Horse	73 ft.	134,600	Bethlehem Ship	24,411	Mar., 1927	J
	6	Dining	80½ ft.	160,500	Pullman	49,933	Mar., 1927	J
Wabash	6	Pass. & Bagg.	78½ ft.	143,500	Am. Car & Fdy	23,300	Apr., 1927	G
	6	Pass. & Bagg.	78½ ft.	143,500	St. Louis Car	....		
	10	Coaches	81 ft.	148,000	Am. Car & Fdy.	28,327	Apr., 1927	G
	6	Chair-Smok.	81 ft.	148,600	Am. Car & Fdy.	28,524	Apr., 1927	G
	4	Chair	81 ft.	148,400	Am. Car & Fdy.	28,100	Apr., 1927	G
	6	Dining	81½ ft.	165,500	Pullman	43,761	Apr., 1927	G
	4	Chair & Lounge	83 ft.	162,000	Pullman	43,146	Apr., 1927	G
	2	Cafe-Chair	76 ft.	157,000	Pullman	40,455	Apr., 1927	G

cases where cars or locomotives of approximately the same character may be found to have different prices on different orders. The explanation usually is that there is some extenuating factor that does not appear in the records.

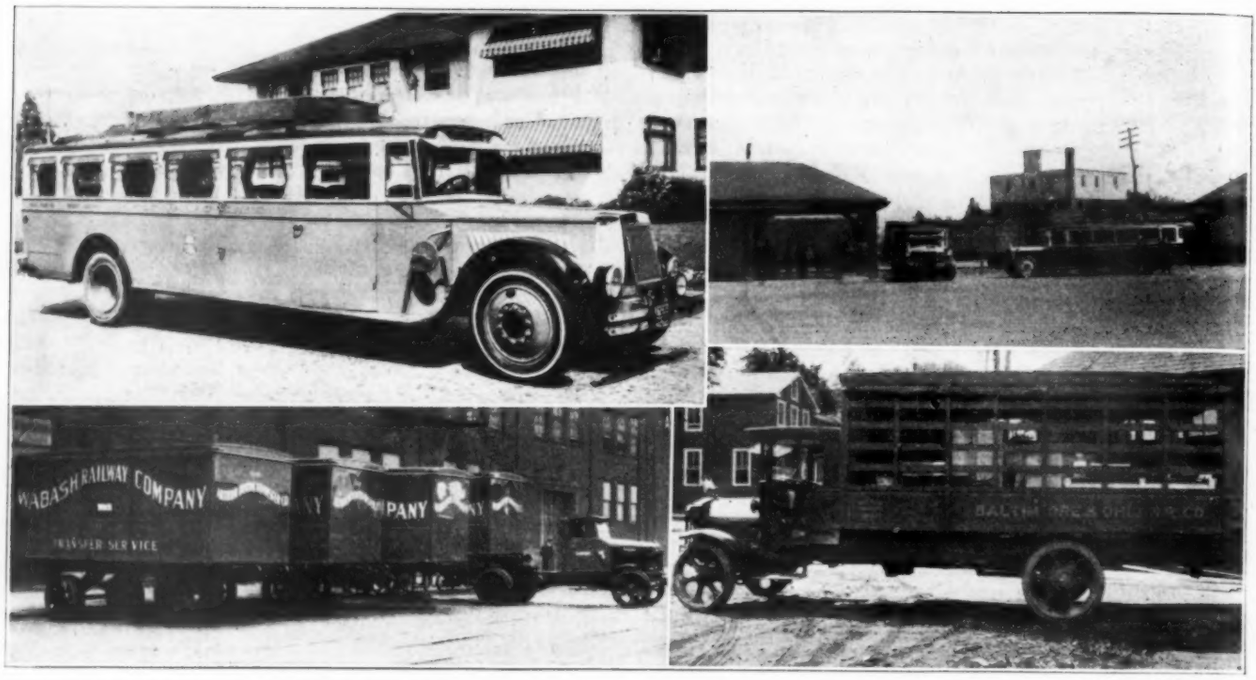
Thus, in the case of passenger cars there could be instances of two dining cars ordered by different railroads at approximately the same time, one of which cars might cost more than the other. The explanation in such case might be that the more expensive car had more elaborate interior furnishings.

There will be cases of locomotives of the same type and of approximately the same weight that will vary widely in price. In most of such instances the variation will be explained by a difference in tractive force which will be apparent in the tabulations. This greater tractive force without increase in weight may be brought about by greater refinement of design or the addition of certain specialties not put on the less costly locomotive.

Variations in price also result from the addition of boosters, stokers, water tube fireboxes, higher boiler pressures, etc. The possibility of variations in price due to engineering and development costs will also be appreciated.

Similar qualifications will apply in the case of freight cars. There will be instances, especially, where cars having different prices will be found to vary primarily because the more expensive car is of stronger construction.

It will, of course, be recognized that prices at one time of the year may be different from those in another part of the year, and that frequently the prices on larger orders are better than those on smaller ones.



Evidence of the Adoption of Motor Vehicles by the Railways

Railway Motor Coach and Truck Operation Spreads

Year marked by steady progress, both in number of roads operating on highways and in number of vehicles operated

By John C. Emery and James G. Lyne

THE steady progress in the use of motor coaches and motor trucks, tractors and trailers by the railways, which was notable in 1926, continued throughout 1927. During the last 12 months, more than a dozen railways, including some of the leading Class I carriers, installed their initial motor coach routes in co-ordination with their railway lines, while several others inaugurated their first motor truck, tractor and trailer services for the handling of l.c.l. freight.

Even more important as proof of the value of the service rendered the railways by their motor vehicle operations is the fact that, almost without exception, the railways which were operating motor coaches and trucks prior to the beginning of 1927 increased the scope of their operation of motor vehicles substantially during the year just closed. As a result of this spread of the operations of motor vehicles by the railways, including those new at the business of motor transportation and those more experienced in it, the number of railways of all classes operating motor coaches at this time is approximately 60 and the number of motor coaches which they are operating is in excess of 950; the number of railways operating motor trucks, tractors and trailers for the transportation of l.c.l. freight in making terminal transfers and line deliveries is approximately 58, and the number of such units which they operate now exceeds 4,000.

New Operations

The most important new operation of motor coaches by a steam railway, at least from the standpoint of the number of vehicles operated,, during the past year, was that of the Southern Pacific. This railway organized a subsidiary company, the Southern Pacific Motor Transport Company, and after establishing several motor coach routes in central California, placed several hundred miles of coach routes in operation paralleling its railway lines in Oregon, on which a fleet of some forty motor coaches is being operated. Another important new operation in the west is that of the Oregon-Washington Railroad & Navigation Company, which, through a subsidiary, the Union Pacific Stages, Inc., has placed in operation a motor coach route extending from Portland, Ore., to Pendleton, where connection is made with the older coach route of this company extending from Pendleton to Walla Walla, Wash. Another western installation is that of the Missouri Pacific, which is contracting for motor coach service between Pueblo, Col., and Ordway. Mention should also be made of the Denver & Rio Grande Western, which has steadily expanded its motor coach and truck operations in interior Colo-

rado, having now approximately 500 miles of highway routes in service.

In the eastern half of the United States there were several outstanding new developments. The Central of New Jersey placed in operation a motor coach route between Lakewood, N. J., and Barnegat, and it recently awarded a contract for the operation of motor coach service between its passenger terminal at Jersey City, N. J., and the center of Manhattan Island, N. Y. The Seaboard Air Line launched an ambitious motor coach operating program and now has several routes in North Carolina, Georgia and Florida. The Chesapeake & Ohio contracted for motor coach service to transport its employees between Covington, Ky., and Stevens. The Central of Georgia purchased equipment and received authority to operate a motor coach line in Georgia, and the Reading, which is still waiting for the motor coach operating certificates which it requested nearly two years ago, is operating several short motor coach routes in Pennsylvania in the name of its passenger traffic manager.

The Baltimore & Ohio, which has continued its Jersey City-New York motor coach service, recently won a victory in the West Virginia courts, which will bring with it the B. & O.'s first certificate for motor coach operation in that state provided the case does not go to the United States Supreme Court. The Chicago & Alton, which has likewise had difficulty in securing certificates of permission to operate motor coaches, now has applications pending covering approximately 600 miles of highway lines. In the meantime, it is operating approximately 150 miles of coach routes in Illinois.

The Wabash last year established tractor and trailer service in Chicago, in replacement of trap cars, which has proved highly successful, 3 tractors and 11 semi-trailers being used in this service. The Chicago Tunnel Company, which operates an underground railway for the transfer of l.c.l. freight in Chicago, organized a subsidiary and is operating a fleet of tractors and trailers to provide storedoor delivery.

The railways which were operating motor vehicles in freight service a year ago have considerably augmented their truck, tractor and trailer services. Outstanding among these are the New York Central, the Pennsylvania, the Baltimore & Ohio, the Southern Pacific, the Boston & Maine, the New York, New Haven & Hartford and the Chicago, Rock Island & Pacific, to mention only a few. The New York Central is still the leading railway operator of trucks, tractors and trailers, having now more than 1,500 vehicles in use.

The older operators of motor coaches have generally expanded their operations on a large scale. Prominent among such railways are the New Haven, the Boston & Maine, the Spokane, Portland & Seattle, the Pennsylvania, the Great Northern, the Denver & Rio Grande Western, the Colorado & Southern and the Union Pacific. The railways have continued to use motor coaches chiefly to supplement or replace passenger train service, although a trend toward the increasing operation of motor coaches to transport employees and provide tours in scenic regions is noted.

Independent Operators Consolidating

The past year has seen a distinct tendency toward the consolidation and stabilization of independent motor coach and truck operations. The effect of this tendency is that small and relatively weak competitors of the railways for traffic are being replaced by large, well organized, well financed and efficiently operated competitors. The movement toward the consolidation of the independents has not been confined to any one locality.

Although accurate statistics are not yet available, it appears that the period of remarkably fast expansion in the field of independent motor coach operation is nearing its end. It is considered probable that there has been very little, if any, increase in the total number of motor coaches and trucks operated in competition with the railways during the past year. While numerous new motor coach and motor truck lines have been installed, it is believed that these have been considerably offset by lines which have gone out of business.

As good roads are extended, there will unquestionably be additional motor coach and truck lines operating over them, but, on the other hand, many independent companies, particularly those which are operating interstate and are, therefore, unregulated as yet, are expected to drop out as time goes on. The effect of this and of the trend toward consolidation will undoubtedly be more severe and more extensive competition from the independent operators in spite of the expected relatively small increase in the aggregate number of motor vehicles in operation.

The Legislative Situation

Efforts to secure last year the passage of legislation in Congress which would regulate interstate motor coach and truck lines proved unsuccessful. This issue is expected to be a live one in the present Congress, however, and the outlook is for the early passage of legislation regulating interstate motor coach lines, at least, if not interstate motor truck lines.

Several more states have passed laws providing for the regulation of intrastate motor coach and truck lines within their boundaries. The number of such states now having regulatory laws applying to the motor carriers is 42. This number is expected to be increased during the present year with the probability that within this year or the next all states will have such laws.

Mention should be made of the decision of the Supreme Court of West Virginia involving the Baltimore & Ohio, which is of extreme importance to the railways. Briefly, this decision ruled that when a railway is one of several applicants for a permit to operate motor coaches over a highway between points served by its line, the regulatory commission should give preference to the railway in the granting of the certificate. This decision is similar to one handed down by the Illinois Supreme Court about a year ago. The West Virginia decision, however, has not yet been made mandatory as the independent operators have signified their intention of carrying the case to the United States Supreme Court.

Motor Transport Division

Probably the outstanding event of 1927 from the standpoint of railway motor transport was the formation of the Motor Transport Division of the American Railway Association. This division will hold its first meeting in Chicago on January 25 and 26, at which its organization will be effected and its work outlined.

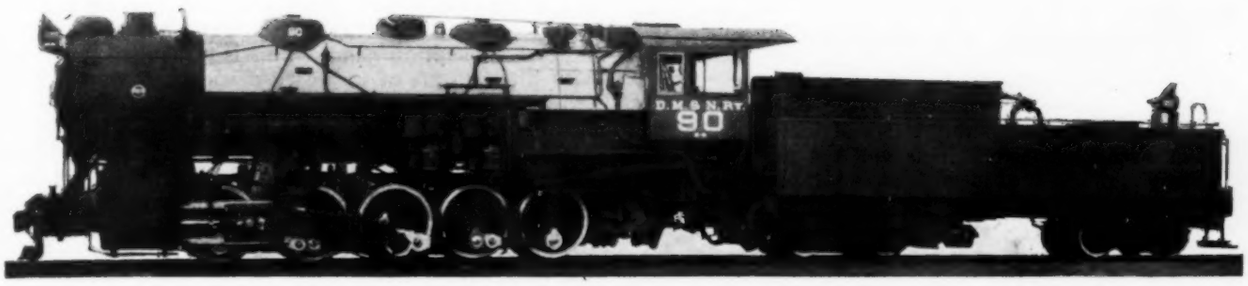
The Motor Transport Division succeeds the Railroad Motor Transport Conference, which was organized in 1926, and after holding two meetings, suspended activities pending the action of the American Railway Association upon its application to become affiliated with the association. Approval of this affiliation, through the organization of the Motor Transport Division to replace the Railroad Motor Transport Conference, was given by the board of directors of the A. R. A. in September, and was finally approved by the member roads of the association in November. Immediate steps were taken to put the new division into operation, with the result that the first meeting was called for this month.

Available statistics on purchases of highway vehicles for railroad use continue fragmentary. In the first place, vehicles devoted entirely to railroad use but which are contracted for rather than owned, are not reported by the railroads. Secondly, a large percentage of motor vehicles owned by railroads or their highway subsidiaries have been acquired through the purchase of independent operators and are not shown as purchases of individual units. In the third place, many sales of motor vehicles are made to railroads and their subsidiaries by local agents and are not therefore known to the manufacturers.

Orders reported herein therefore are restricted to those supplied by railroads. They yield a total of 132 motor coaches, 47 trucks and 35 passenger automobiles, as follows:

Orders for Highway Vehicles

Railroad	No.	Type of vehicle	Model designation	Bus seating capacity or truck capacity in tons	Purchased by railroad or subsidiary	Where to be used	Manufacturer
Atlantic Coast Line	1	Truck	.....	2 ton	Railroad	Mail-Exp.	Graham
Boston & Maine	5	M. Coach	Type Y	29	Railroad	Pass.	Yellow
	4	M. Coach	Type 50B	29	Railroad	Pass.	White
	4	Truck	.....	1 ton	Railroad	M. of W.	Ford
	3	Truck	.....	½ ton	Railroad	Trouble Car	Ford
	2	Coupe	.....	.....	Railroad	Traffic	Dodge
	2	Roadster	.....	.....	Railroad	Freight	Chevrolet
	1	Truck	T-40	2 ton	Railroad	Shop	General Motors
	1	Truck	.....	¾ ton	Railroad	Bagg.	Dodge
Central of Georgia	1	M. Coach	Pass. Bagg. & Exp.	15	Subsidiary	Pass. Bag. & Exp.	Mack
Central of New Jersey	2	M. Coach	508-2B3 "L"	28	Subsidiary	Pass.	A. C. F. Motors
Chicago & Alton	2	M. Coach	Type Z-25PE	25	Subsidiary	Pass.	Yellow
Chicago, Indianapolis & Louisville	1	Sedan	T	4	Railroad	Traffic	Ford
Chicago, Milwaukee & St. Paul	1	Truck	.....	.....	.....	.....	Yellow
Clev., Cinn., Chicago & St. Louis	1	Truck	BC	1 ton	Railroad	Shop	Dodge
	1	Truck	5-24	1¼ ton	Railroad	Shop	Internat'l Harvester
	1	Coupe	.....	3	Railroad	Employee	Dodge
	1	Truck	BD	1 ton	Railroad	Shop	Dodge
	1	Truck	.....	.....	Railroad	Mail	Pontiac
Copper Range	1	M. Coach	Model 53	25	Subsidiary	Pass.	White
Colorado & Southern	2	M. Coach	Type X	17-21	Subsidiary	Pass.	Yellow
Delaware, Lackawanna & Western	1	Truck	No. 18	2 ton	Railroad	Co. Serv.	Steward
	1	Truck	No. 64	3 ton	Railroad	Co. Serv.	Maccar
Duluth & Iron Range	1	Truck	Model F.B. Serial 12 Speedwagon	1½ ton	Railroad	M. of W.	Reo
East Tennessee & Western N. Carolina	1	M. Coach	Model 53	20	Subsidiary	Pass.	White
	1	M. Coach	Model 53	17	Subsidiary	Pass.	White
	1	M. Coach	Model 53	15	Subsidiary	Pass.	White
Great Northern	5	M. Coach	Type Y	29	Railroad	Pass.	Yellow
	9	M. Coach	GW	29	Railroad	Pass.	Wills Motor Corp.
	6	M. Coach	GY	38	Railroad	Pass.	Wills Motor Corp.
Illinois Central	1	Truck	.....	1 ton	Railroad	Shop	Ford
	1	Truck	Model S-24	1¼ ton	Railroad	Stores	Internat'l Harvester
	2	Truck	Model 51	2¼ ton	Railroad	M. of W.	White
Los Angeles & Salt Lake	4	M. Coach	Model 54	16	Subsidiary	Pass.	White
McCloud River	1	M. Coach	.....	20	Subsidiary	Pass.	White
Missouri-Kansas-Texas	1	M. Coach	Model T	10	Railroad	Employee	Ford
	1	M. Coach	Type No. 527	26	Railroad	Employee	Graham
	1	Roadster	Model T	2	Railroad	Employee	Ford
	1	M. Coach	Model 15	16	Railroad	Employee	Internat'l Harvester
New York Central	1	Truck	No. 522 Chassis TCR	2 ton	Railroad	M. of W.	Graham
	1	Truck	K-102B	7½ ton	Railroad	M. of W.	General Motors
	1	Truck	1927	1¼ ton	Railroad	M. of W.	Graham
	1	Carryall	.....	¾ ton	Railroad	M. of W.	Graham
New York, New Haven & Hartford	6	M. Coach	6 Cyl.	29	Subsidiary	Pass.	Fageol
	15	M. Coach	6 Cyl. "Newell"	29	Subsidiary	Pass.	A.C.F. Motors
	3	M. Coach	6 Cyl. "Newell"	29	Subsidiary	Pass.	A.C.F. Motors
	1	Truck	4 Cyl. A.C.	3½ ton	Subsidiary	Wrecker	Mack
	12	M. Coach	4 Cyl. A.B.	29	Subsidiary	Pass.	Mack
	1	M. Coach	4 Cyl. A.B.	29	Subsidiary	Pass.	Mack
	1	M. Coach	"Z"	29	Subsidiary	Pass.	Pierce Arrow
	9	Pleas.	58	.....	Subsidiary	Employee	Chrysler
	2	Truck	Speedwagon	2 ton	Railroad	Employee	Reo
	1	Sedan	T	5 ton	Railroad	Employee	Ford
Norfolk Southern	1	M. Coach	.....	21	Subsidiary	Pass.	Mack
Norfolk & Western	1	Truck	.....	2 ton	Railroad	Shop	Reo
Ohio Central Lines	2	Truck	Nos. 505-506	1½ ton	Railroad	Stores	Graham
Oregon-Washington	2	M. Coach	.....	27	Railroad	Pass.	Mack
	2	M. Coach	.....	26	Railroad	Pass.	A.C.F. Motors
	1	Tract. & Trail.	.....	6-8 ton	Railroad	Freight	Internat'l Harvester
Pennsylvania	1	Truck	.....	3½ ton	.....	.....	.....
	1	Truck	.....	2 ton	.....	.....	.....
	1	Truck	.....	2½ ton	.....	.....	.....
	1	Truck	.....	1½ ton	.....	.....	.....
	1	Truck Chassis	.....	2 ton	.....	.....	.....
	2	Sedan	.....	4 persons	.....	.....	.....
	3	Sedan	.....	5 persons	.....	.....	.....
	2	Sedan	.....	7 persons	.....	.....	.....
	2	Coupe	.....	2 persons	.....	.....	.....
Seaboard Air Line	1	M. Coach	AB	29	Subsidiary	Pass.	Mack
	1	M. Coach	AL	21	Subsidiary	Pass.	Mack
	1	M. Coach	54	23	Subsidiary	Pass.	White
	3	M. Coach	601-109	23	Subsidiary	Pass.	A.C.F. Motors
	1	M. Coach	508-4 B-6	21	Subsidiary	Pass.	A.C.F. Motors
Southern	1	Truck	Model 43	2 ton	Railroad	Shop	Internat'l Harveste
	2	Truck	Ford	1 ton	Railroad	Employee	Ford
Southern Pacific	20	M. Coach	.....	29	.....	.....	.....
	9	M. Coach	.....	21	.....	.....	.....
	2	M. Coach	.....	23	.....	.....	.....
	3	Truck	.....	2 ton	.....	.....	.....
	1	Truck	.....	1½ ton	.....	.....	.....
	1	Truck	.....	1 ton	.....	.....	.....
	1	Touring	.....	.....	.....	.....	.....
	4	Coupe	.....	.....	.....	.....	.....
	1	Coupe	.....	.....	.....	.....	.....
	2	Roadster	.....	.....	.....	.....	.....
Spokane, Portland & Seattle	3	M. Coach	Type 53	19	Subsidiary	Pass.	White
Union Pacific	1	Truck	.....	1 ton	Railroad	Stores	Ford
Virginia & Truckee	1	Touring	Type E.P.	7	Railroad	Pass.	Studebaker



Duluth, Missabe & Northern 0-10-0 Type Locomotive Equipped with Tender Booster—Built by the Baldwin Locomotive Works

Locomotives Ordered in 1927

Total orders placed in year are far below those of last year—Exports decline

By Lloyd George
Associate Editor, *Railway Age*

LOCOMOTIVES ordered for domestic service in the United States in 1927 totaled 734, in contrast to 1,301 ordered in 1926, a year that was described in the *Railway Age* a year ago as "below normal." With the decline in 1927 to a figure a little more than half of that in 1926, a low point in 27 years' orders was approached, there being only two lower years' totals —that in 1921 when 239 locomotives were ordered, and that in 1919 when 214 were ordered.

Orders for locomotives placed by railroads in Canada with builders there nearly equaled those a year ago, 1927 seeing 58 ordered as against 61 in 1926. There have been only three higher totals since 1920, there being orders for 68 placed in 1922, for 82 in 1923, and for 71 in 1924.

Table I—Locomotive Orders in 1927

For service in the United States	734
For service in Canada	58
For export to other countries	54
Grand total	846

Export orders were low as were those for domestic service. Locomotives ordered for use in foreign territory totaled only 54, less than a third of what they were a year ago.

Locomotives built in 1927 for service in the United States and Canada, as distinguished from those ordered in the year, totaled 1,009 as compared with 1,585 in 1926. Records reported since 1896 show that few other years have seen less built. It is well to note the distinction between the number of locomotives ordered and the number built and it is desirable to emphasize the difference in considering equipment statistics. Because it takes several months to build a locomotive, the produc-

Table II—Orders for Locomotives Since 1901

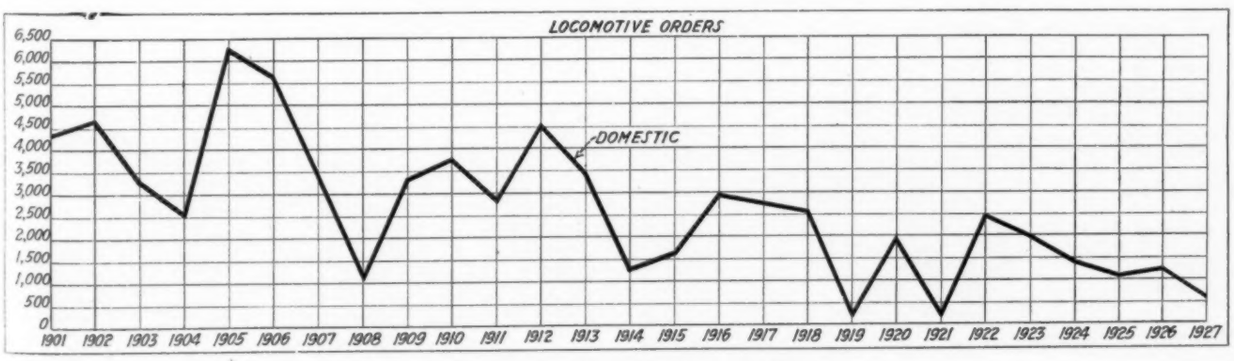
Domestic Orders Only

Year	Locomotives	Year	Locomotives
1902	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1912	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	1,612	...	850	2,462
1916	2,910	...	2,983	5,893
1917	2,704	...	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	989	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542
1927	734	58	54	846

Prior to 1918, Canadian orders included under "Domestic."



Locomotive Orders, 1901 to 1927

tion figure of locomotives in any year includes some ordered in a previous year, and there is an appreciable overlap from year to year that results in a total production figure different from the total ordered.

The Car Service division of the American Railway Association reports monthly totals of locomotive installations and retirements. This will not agree with the *Railway Age* totals of locomotives ordered or built. This follows because the Car Service division total covers only Class 1 carriers, whereas the *Railway Age* figures cover all carriers, and also because the Car Service division's report includes, under installations, locomotives leased from the other roads or rebuilt locomotives.

A year ago in this report, the manner of locomotive buying was spoken of as "conservative." The manner has continued so until it has become more than that. In 1927 it was, if anything, decidedly hesitant. A number of factors might be said to enter into the decline in purchases, but principally the factors of improved design of units with its attendant increase in efficiency per unit and the increased efficiency of railroad operation embodied in the program adopted in 1923, and which has been carried further each year, have had a great deal to do with making 1927 a year in which orders placed were fewer than in any other with the exception of 1919 and 1921.

For what it may mean, it is interesting to note that the years immediately following each of these two poor ones were among some of the best years recorded, 1920 showing approximately 2,000 ordered and 1922, 2,600 ordered. The implication in the statement that high years follow low ones is that orders are placed in the high ones that were held off during the low ones, and so a balance of power is kept on hand. This is no longer quite true with the elements of increased efficiency of power units and increased efficiency of railroad operation entering into the matter. It is apparently not necessary to buy new locomotives to handle increased traffic to the same extent as formerly. The number of locomotives purchased in the last three years has been somewhat less than in other years, yet net ton miles have increased in 1925 over 1924, 1926 over 1925, and 1927 will not show any great change from 1926.

There is no doubt that increased efficiency has had an effect on the buying of all equipment, but how largely the comparatively low number of orders placed in 1927 is due to increased efficiency remains an open question. The decline under other years seems to be too sharp to be wholly attributable to the efficiency factor, and it may be fair to say that orders should rebound to a higher figure in 1928, although with efficiency of operation advanced to the point that it is, the rebound to be expected need not be as great as in those years following the ebb of orders in 1919 and 1921. The orders placed in the closing weeks of 1927 promise of better months to come. The Boston & Maine and the Southern did not place their locomotive orders until the last week in the year, a time when there were other inquiries out that were expected to be filled early in the new year.

While large orders placed for locomotives by various railroads in 1927 did not compare with those placed in the previous year, it is of interest to note that the largest order was given by the Erie for 82, the next largest by the Southern for 68, the next by the New York Central System for 60, and the next by the Missouri Pacific for 36.

In the list of orders for locomotives appended some few omissions of small orders doubtless occur. The details presented were supplied by the railways and other purchasers of locomotives in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. Because of the short time available for the compilation, and the haste necessary to insure publication so close after the end of the year, the *Railway Age* does not desire to make any claims as to the scientifically statiscal accuracy of the tabulations or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy.

Table III—Locomotives Built in 1927

Domestic (United States, Canada)	1,009
Foreign	167
Total	1,176

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896	866	309	1,176	1912†	4,403	512	4,915
1897	865	386	1,251	1913†	4,561	771	5,332
1898	1,321	554	1,875	1914†	1,962	273	2,235
1899	1,951	514	2,475	1915†	1,250	835	2,035
1900	2,648	505	3,153	1916†	2,708	1,367	4,075
1901	....	....	3,384	1917†	2,585	2,861	5,446
1902	....	....	4,070	1918†	3,668	2,807	6,475
1903	....	....	5,152	1919†	2,162	1,110	3,272
1904	....	....	3,441	1920†	2,022	1,650	3,672
1905*	4,896	595	5,491	1921†	1,185	638	1,823
1906*	6,232	720	6,952	1922†	1,303	231	1,534
1907*	6,564	798	7,362	1923†	3,505	280	3,795
1908*	1,886	456	2,342	1924†	1,810	226	2,036
1909*	2,596	291	2,887	1925†	994	291	1,285
1910*	4,441	314	4,755	1926†	1,585	185	1,770
1911*	3,143	387	3,530	1927†	1,009	167	1,176

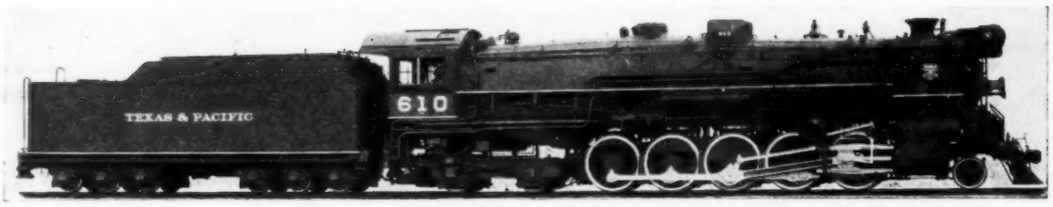
*Includes Canadian output.
†Includes Canadian output and equipment built in railroad shops.

Locomotive Orders in 1927

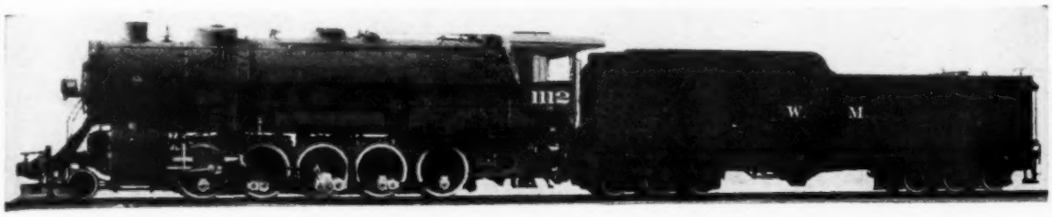
For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Alabama State Docks	1	4-6-0	....	163,000	39,100	21 x 28	May	August	American
Alabama, Tennessee & Northern	2	0-6-0	Sw.	.....	.....	.....	August	.....	Baldwin
Apalachicola Northern	1	2-10-0	....	136,000	.....	19 x 26	March	.....	American
Atchison, Topeka & Santa Fe	10	2-10-2	Frt.	.....	85,360	30 x 32	January	Feb.-May	Baldwin
Bangor & Aroostook	5	4-6-2	Pass.	237,000	32,000	21 x 28	April	September	American
Barber Asphalt Co.	1	0-6-0	Sw.	150,600	32,700	20 x 26	February	.....	Baldwin
Belt Railway of Chicago	5	0-8-0	Sw.	258 000	63,000	27 x 30	September	November	Baldwin
Boston & Maine	10	0-8-0	Sw.	242,370	54,000	23 x 28	August	December	Baldwin
	20	2-8-4	Frt. & Pass.	385,000	69,400	28 x 30	December	.....	Lima
Brown Paper Mill, Inc.	1	2-6-2	Frt.	104,000	20,430	16 x 24	October	.....	Baldwin
Calif. State Bd. of Harb. Comm.	1	0-6-0	Sw.	147,700	27,380	20 x 24	June	.....	Baldwin
Carolina Southern	1	2-6-0	....	88,000	.....	16 x 24	.....	.....	American
Central of New Jersey	5	4-6-2	Pass.	327,500	46,920	26 x 28	May	December	Baldwin
	10	0-8-0	Sw.	255,100	61,422	24 x 30	May	Sept.-Oct.	Baldwin
Central Vermont	4	4-8-2	....	318,000	.....	26 x 28	.....	.....	American
Chicago & Illinois Midland	2	4-4-0	Pass.	118,400	18,800	18 x 24	April	.....	Baldwin
	3	2-10-2	Frt.	363,550	69,500	27 x 32	June	.....	Baldwin
Chicago & North Western	12	2-8-4	....	395,000	.....	28 x 30	March	.....	American
	8	0-8-0	....	225,000	.....	25 x 28	March	.....	American

Pressure, 255 lb.
Drivers, 63 in.
Cyls., 29 in. by 32 in.
Wt., drivers, 300,000 lb.
Wt., engine, 448,000 lb.
H't'g. surface, 5,113 sq. ft.
Superheater, 2,100 sq. ft.
Grate, 100 sq. ft.
Tr. force, 84,600 lb. (60 per cent c.o.)
Tr. force, booster, 97,900 lb.



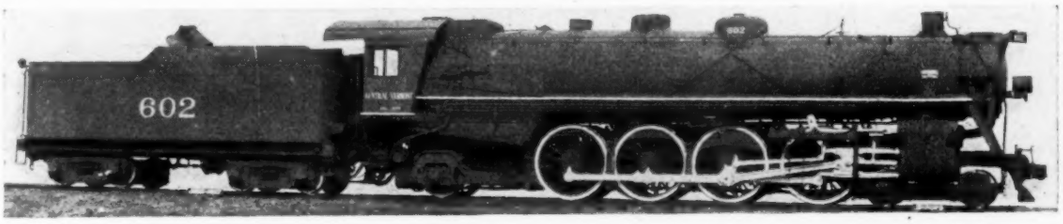
Texas & Pacific 2-10-4 Type Built by the Lima Locomotive Works, Inc.



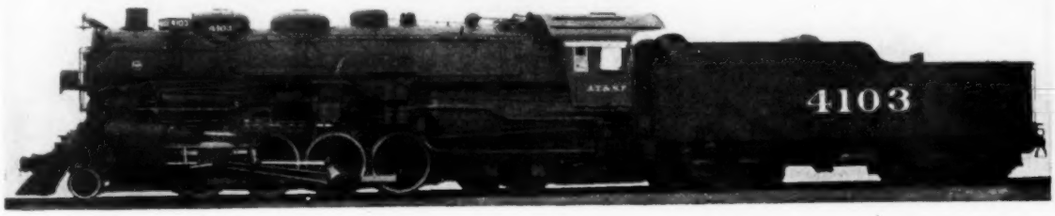
Pressure, 225 lb.
Drivers, 61 in.
Cyls., 30 in. by 32 in.
Wt., drivers, 386,800 lb.
Wt., engine, 419,280 lb.
H't'g. surface, 4,431 sq. ft.
Superheater, 1,248 sq. ft.
Grate, 104.5 sq. ft.
Tr. force, 90,000 lb.

Decapod Locomotive Built for the Western Maryland by the Baldwin Locomotive Works

Pressure, 200 lb.
Drivers, 73 in.
Cyls., 26 in. by 28 in.
Wt., drivers, 215,500 lb.
Wt., engine, 325,000 lb.
H't'g. surface, 3,856 sq. ft.
Superheater, 968 sq. ft.
Grate, 66.8 sq. ft.
Tr. force, 44,000 lb.



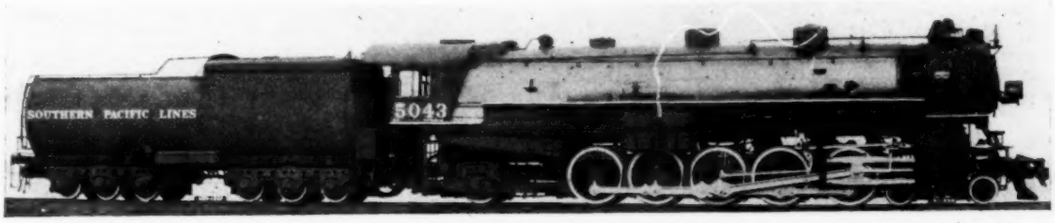
4-8-2 Type Built for the Central Vermont by the American Locomotive Company



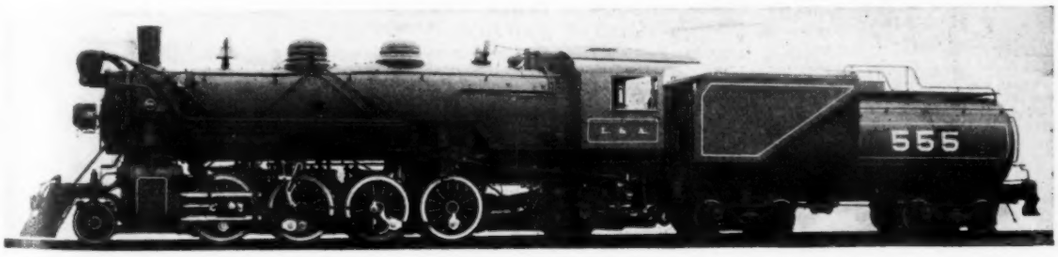
Pressure, 220 lb.
Drivers, 63 in.
Cyls., 27 in. by 32 in.
Wt., drivers, 268,200 lb.
Wt., engine, 396,500 lb.
H't'g. surface, 4,577 sq. ft.
Superheater, 1,246 sq. ft.
Grate, 99 sq. ft.
Tr. force, 69,200 lb.
Tr. force, booster, 82,800 lb.

Atchison, Topeka & Santa Fe 2-8-4 Type Locomotive Built by the Baldwin Locomotive Works

Pressure, 225 lb.
Drivers, 63½ in.
Cyls. (3) 25 in. by 28 in. and 32 in.
Wt., drivers, 317,500 lb.
Wt., engine, 445,000 lb.
H't'g. surface, 5,676 sq. ft.
Superheater, 1,500 sq. ft.
Grate, 89.6 sq. ft.
Tr. force, 83,500 lb. (70 per cent c.o.)
Tr. force, booster, 95,700 lb.



Three-Cylinder 4-10-2 Type Built by the American Locomotive Company for the Southern Pacific



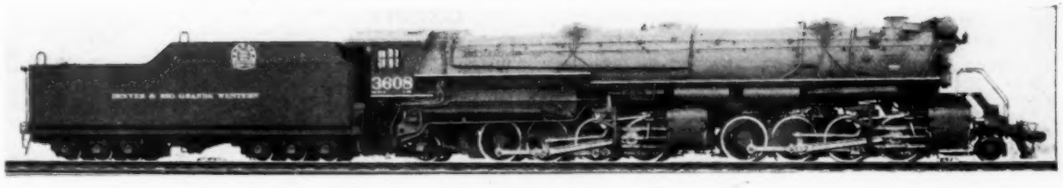
Pressure, 200 lb.
Drivers, 57 in.
Cyls., 24 in. by 28 in.
Wt., drivers, 183,680 lb.
Wt., engine, 256,130 lb.
H't'g. surface, 3,491 sq. ft.
Superheater, 782 sq. ft.
Grate, 57.2 sq. ft.
Tr. force, 48,100 lb.
Tr. force, booster, 59,600 lb.

Freight Locomotive Built by the Baldwin Locomotive Works for the Louisiana & Arkansas

Purchaser	No.	Type	Service	Length Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder	
Chicago, Burlington & Quincy...	12	2-10-4	Frt.	512,110	90,000	31 x 32	April	.....	Baldwin	
	2	0-6-0	Sw.	159,266	37,485	21 x 26	January	July	Company	Shops
	3	0-8-0	Sw.	256,280	60,700	25 x 32	January	November	Company	Shops
Clearwater Timber Co.....	2	Geared	Logging	160,000	34,220	.....	.....	.....	Heisler	
	2	Geared	Logging	160,000	31,940	.....	.....	.....	Heisler	
Clemons Logging Co.....	1	2-6-6-2	Frt.	.....	.....	.....	December	.....	Baldwin	
Columbia Steel Corp.....	1	0-4-0	Sw.	78,000	17,360	14 x 22	March	.....	Baldwin	
Commonwealth Edison.....	1	0-6-0	Sw.	159,500	35,300	21 x 26	January	March	Lima	
Delaware & Hudson.....	1	.....	....	.....	.....	.....	.....	.....	Company	Shops
Delaware, Lackawanna & Western	10	4-8-2	Frt.	397,500	87,800	25x28&32-3-cyl.	May	September	American	
	5	4-8-4	Pass.	421,000	64,500	27 x 32	May	October	American	
Denver & Rio Grande Western..	10	2-8-8-2	Frt.	649,000	131,800	26 x 32	May	August	American	
Detroit & Toledo Shore Line....	4	2-8-2	Frt.	310,040	54,800	26 x 30	November	January	Baldwin	
	4	0-8-0	Sw.	220,000	51,200	25 x 28	October	December	American	
Dierks Lumber & Coal Co.....	2	2-8-2	Frt.	128,300	24,100	17 x 24	February	.....	Baldwin	
Duluth, Missabe & Northern....	4	0-10-0	Sw.	340,000	82,400	28 x 30	July	Dec.-Jan.	Baldwin	
Elk River Mill & Lumber Co.....	1	Geared	Logging	56,000	13,100	.....	.....	.....	Heisler	
Erie	25	2-8-4	Frt.	443,000	71,000	28½ x 32	July	September	American	
	30	0-8-0	Sw.	230,210	57,210	25 x 28	July	October	Baldwin	
	25	2-8-4	Frt.	457,500	72,000	28½ x 32	July	October	Lima	
	*15	tenders	....	.....	.....	.....	.....	.....	Baldwin	
Grand Trunk Western.....	12	4-8-4	....	400,000	.....	26¼ x 30	February	.....	American	
	10	0-8-0	Sw.	214,000	49,700	22 x 28	October	December	Baldwin	
	10	0-8-0	Sw.	214,000	49,700	22 x 28	February	April	Lima	
Great Northern.....	4	2-8-8-2	Frt.	594,940	127,500	4-28 x 32	January	January '28	Company	Shops
	*22	tenders	....	17,000gc	.....	.....	January	December	Company	Shops
Gulf Coast Lines.....	6	4-6-2	Pass.	302,000	43,970	27 x 28	January	April-May	American	
	5	0-8-0	Sw.	230,500	57,750	25 x 28	January	April-May	American	
Gulf, Mobile & Northern.....	4	2-10-0	Frt.	254,000	62,850	25 x 30	April	July	Baldwin	
	2	4-6-2	Pass.	220,000	35,000	22 x 28	November	.....	Baldwin	
Huntingdon & Broad Top.....	2	2-8-0	Frt.	163,730	36,300	21 x 26	January	.....	Baldwin	
Illinois Central.....	15	0-8-0	Sw.	221,400	51,041	25 x 28	June	August	Baldwin	
Illinois Coal Corp.....	1	Geared	....	84,000	19,530	14 x 12	December	.....	Heisler	
Illinois Terminal Co.....	1	2-6-0	Sw.	182,600	36,700	22 x 26	March	.....	Baldwin	
Inland Steel Co.....	1	0-6-0	Sw.	177,800	39,800	22 x 26	February	.....	Baldwin	
International-Great Northern.....	5	0-8-0	Sw.	230,500	57,750	25 x 28	January	April-May	American	
International Lumber Co.....	1	Geared	Sw.	110,000	24,160	.....	.....	.....	Heisler	
Johnstown & Stony Creek.....	1	0-6-0	Sw.	176,200	44,000	23 x 28	April	.....	Baldwin	
Kansas, Oklahoma & Gulf.....	3	2-10-2	Frt.	329,300	59,000	27 x 30	May	.....	Baldwin	
	2	2-10-2	Frt.	329,300	59,000	27 x 30	June	.....	Baldwin	
Lake Terminal.....	1	0-8-0	....	218,000	.....	25 x 28	.....	.....	American	
Larson Lumber Co.....	1	2-6-6-2	Frt.	275,000	56,600	31 x 28	July	.....	Baldwin	
Lehigh & Hudson River.....	2	2-8-0	Frt.	309,700	71,500	27 x 32	February	May	Baldwin	
Lehigh & New England.....	2	2-10-0	Frt.	399,200	90,000	30 x 32	July	September	Baldwin	
	3	0-8-0	Sw.	269,800	68,500	27 x 30	July	Oct.-Nov.	Baldwin	
	3	0-8-0	Sw.	205,760	50,000	23½ x 28	July	September	Baldwin	
Lehigh Coal & Nav. Co.....	2	Geared	....	84,000	19,530	14 x 12	December	.....	Heisler	
Los Angeles Junction.....	1	0-6-0	....	146,000	.....	21 x 26	.....	.....	American	
Louisville, Hend. & St. L.....	1	4-6-2	Pass.	210,000	29,400	22 x 26	July	September	American	
Maine Central.....	*2	tenders	....	.....	.....	.....	February	.....	American	
McRae Lumber & Mfg. Co.....	1	Geared	Logging	140,000	31,940	.....	.....	.....	Heisler	
Mexican Petroleum Corporation...	1	.....	Sw.	78,000	17,360	14 x 22	March	March	Baldwin	
Michigan Central.....	10	4-6-4	Pass.	343,000	42,300	25 x 28	May	November	American	
Mich. Limestone & Chem Co.....	2	0-6-0	Sw.	160,000	35,300	21 x 26	January	March	Lima	
Mid-Continent Coal Corp.....	1	Geared	Sw.	84,000	19,530	.....	.....	.....	Heisler	
Midvale Co.....	1	0-4-0	Sw.	58,500	12,500	13 x 16	May	.....	Baldwin	
Minnesota, Dakota & Western...	1	0-8-0	Sw.	183,600	43,200	21 x 28	January	.....	Baldwin	
Missouri-Illinois	2	2-8-0	Frt.	.....	47,500	23 x 28	September	November	American	
Missouri Pacific.....	5	4-8-2	....	381,000	.....	27 x 30	.....	.....	American	
	15	0-8-0	....	231,000	.....	25 x 28	.....	.....	American	
Mobile & Ohio.....	5	0-6-0	Sw.	165,000	.....	21 x 28	January	.....	American	
	8	0-6-0	Sw.	164,000	.....	21 x 28	December	.....	American	
	5	2-8-2	....	293,000	.....	26 x 30	December	.....	American	
Monongahela	6	2-8-2	Frt.	318,740	54,700	26 x 30	April	July	Baldwin	
New England Fuel & Trans. Co.	1	0-8-0	Sw.	210,000	51,000	25 x 28	January	April	American	
New Orleans Great Northern....	3	4-8-2	....	273,000	.....	24 x 28	.....	.....	American	
New York Central.....	19	4-6-4	Pass.	348,000	42,300	25 x 28	May	Sept.-Oct.	American	
	20	4-6-4	Pass.	346,500	42,300	25 x 28	May	Sept.-Oct.	American	
	5	4-6-4	Pass.	349,500	42,300	25 x 28	May	Oct.-Nov.	American	
	5	4-6-4	Pass.	348,500	42,300	25 x 28	May	Oct.-Nov.	American	
	*1	tenders	....	12,500g	.....	.....	July	.....	American	
	*55	tenders	....	15,000g	.....	.....	May	.....	American	
New York, New Haven & Hart.	6	0-8-0	Sw.	245,000	60,600	22 x 28	March	August	American	
Norfolk & Western.....	*30	tenders	....	18,000	.....	.....	May	.....	Company	Shops
Oliver Iron Mining Co.....	10	0-8-0	Sw.	.....	.....	.....	March	.....	Lima	
Pennsylvania	25	4-6-2	Pass.	308,890	44,460	.....	April	January	Company	Shops
Peoria & Pekin Union.....	3	0-8-0	Sw.	221,700	51,041	25 x 28	August	October	Baldwin	
Pickands Mather & Co.....	2	0-6-0	Sw.	.....	.....	.....	March	.....	Lima	
Ricker, Hiram, & Sons.....	1	0-6-0	Sw.	105,000	21,400	16 x 24	June	August	American	
Roddis Lumber Co.....	1	Geared	....	72,000	17,110	13 x 12	December	.....	Heisler	
St. Louis & Ohio River.....	1	2-8-2	....	.....	.....	.....	November	.....	American	
Santa Fe Northwestern.....	1	Geared	Logging	140,000	31,940	.....	.....	.....	Heisler	
Seaboard Air Line.....	25	0-6-0	Sw.	.....	.....	.....	December	.....	Baldwin	
Shaw Bertram Lumber Co.....	1	Geared	Logging	160,000	34,220	.....	.....	.....	Heisler	
Southern	55	2-8-2	....	.....	.....	.....	December	.....	Baldwin	
	5	4-6-2	....	.....	.....	.....	December	.....	Baldwin	
	8	2-8-8-2	....	.....	.....	.....	December	.....	Baldwin	
Southern Pacific.....	8	4-8-2	Pass.	368,000	57,510	28 x 30	January	Sept.-Dec.	Company	Shops
	10	4-10-2	Pass. & Ft.	445,000	84,200	25x28 & 32-3 cyl.	March	July-Aug.	American	
Southwest Lumber Co.....	1	Geared	Logging	140,000	31,940	.....	.....	.....	Heisler	
Sugar Pine Lumber Co.....	1	2-10-2	....	265,000	.....	22 x 28	.....	.....	American	
Suncook Valley.....	1	2-6-0	Pass. & Ft.	111,400	23,000	18 x 24	January	.....	Baldwin	
State Belt of California.....	1	.....	Sw.	.....	.....	.....	.....	.....	Baldwin	
Terminal Railroad of St. Louis..	2	0-8-0	Sw.	247,500	60,335	26 x 28	October	April	Company	Shops
	2	0-8-0	Sw.	247,500	60,335	26 x 28	October	June	Company	Shops
Texas & Pacific.....	20	2-10-4	Frt.	448,000	84,600	29 x 32	March	June-July	Lima	
	3	0-8-0	Sw.	230,500	54,500	22 x 28	March	July	Baldwin	
	2	0-8-0	Sw.	232,800	54,500	22 x 28	March	July	Baldwin	
	15	2-10-4	....	448,000	.....	.....	December	.....	Lima	
Toledo, Peoria & Western.....	4	4-8-4	Frt.	225,000	41,000	22 x 26	June	July	American	
United Fruit Company.....	2	.....	Frt.	167,000	19,300	16 x 20	March	July	Baldwin	
Vera Pocahontas Coal Co.....	1	Geared	Sw.	50,000	11,290	.....	.....	.....	Heisler	
Warren-Lamb Lumber Co.....	1	Geared	Logging	84,000	19,530	.....	.....	.....	Heisler	
Wilmette Valley Lumber Co.....	1	2-8-2	....	168,000	.....	18 x 24	.....	.....	American	
Woodard, W. A., Lumber Co.....	1	2-6-2	....	128,000	.....	15 x 24	.....	.....	American	
Youngstown & Northern.....	2	0-6-0	....	180,000	.....	22 x 28	.....	.....	American	
Canada										
Alberta Government.....	3	2-8-0	Frt.	182,000	39,140	22 x 28	July	October	Canadian	
Edmonton, Dunvegan & B. C....	3	2-10-0	Frt.	219,900	47,000	23½ x 28	November	March	Canadian	
By-Products Coke Co. of Canada	1	0-6-0	Sw.	125,000	.....	19 x 26	.....	.....	Montreal	
Canadian National.....	20	4-8-4	Pass. & Ft.	385,590	56,800	25½ x 30	February	June-Oct.	Canadian	
	20	4-8-4	Pass. & Ft.	385,590	56,800	25½ x 30	February	Aug.-Oct.	Montreal	
	2	0-8-0	Sw.	214,000	49,700	22 x 28	July	.....	Company	Shops
	4	0-8-0	Sw.	214,000	49,700	22 x 28	July	.....	Company	Shops
	4	0-8-0	Sw.	214,000	49,700	22 x 28	July	.....	Company	Shops
Canadian Pacific.....	*12	tenders	....	10.000	.....	.....	.....	.....	Montreal	
Roberval-Saguenay.....	1	2-6-0	....	165,000	.....	20 x 26	.....	.....	Montreal	

*Not included in totals.

Pressure, 240 lb.
Drivers, 63 in.
Cyls., (4) 26 in. by 32 in.
Wt., drivers, 559,500 lb.
Wt., engine, 649,000 lb.
H't'g. surface, 7,265 sq. ft.
Superheater, 2,295 sq. ft.
Grate, 136.5 sq. ft.
Tr. force, 131,800 lb. (70 per cent c.o.)

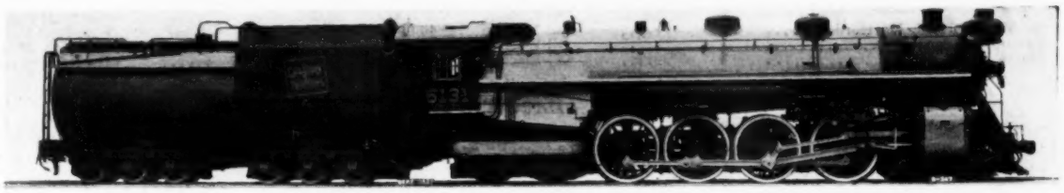


Four-Cylinder Simple Mallet Built by the American Locomotive Company for the Denver & Rio Grande Western

Pressure, 200 lb.
Drivers, 63 in.
Cyls., 27 in. by 30 in.
Wt., drivers, 247,800 lb.
Wt., engine, 329,300 lb.
H't'g. surface, 4,129 sq. ft.
Superheater, 960 sq. ft.
Grate, 70.3 sq. ft.
Tr. force, 59,000 lb.

Santa Fe Type for the Kansas, Oklahoma & Gulf Built by the Baldwin Locomotive Works

Pressure, 250 lb.
Drivers, 73 in.
Cyls., 25½ in. by 30 in.
Wt., drivers, 233,400 lb.
Wt., engine, 381,900 lb.
H't'g. surface, 4,244 sq. ft.
Superheater, 1,840 sq. ft.
Grate, 84.4 sq. ft.
Tr. force, 56,800 lb.

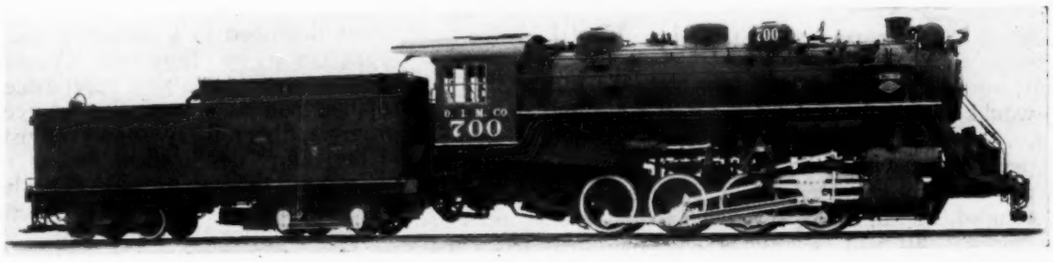


Canadian National 4-8-4 Type Built by the Montreal Locomotive Works, Ltd.

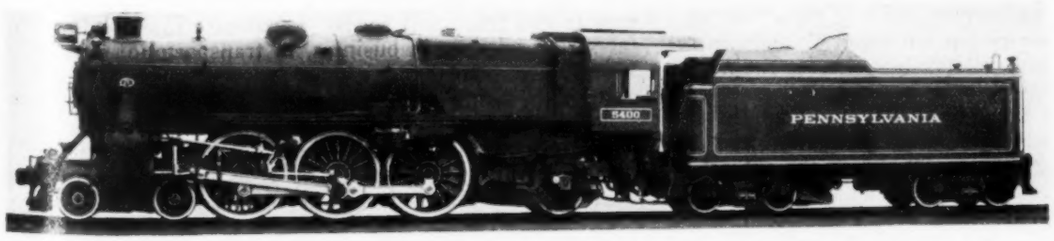
Pressure, 200 lb.
Drivers, 63 in.
Cyls., 26 in. by 30 in.
Wt., drivers, 236,080 lb.
Wt., engine, 318,740 lb.
H't'g. surface, 3,876 sq. ft.
Superheater, 1,080 sq. ft.
Grate, 66.7 sq. ft.
Tr. force 54,700 lb.
Tr. force, booster, 65,700 lb.

Mikado Type Built for the Monongahela by the Baldwin Locomotive Works

Pressure, 225 lb.
Drivers, 50 in.
Cyls., 23 in. by 28 in.
Wt., drivers, 254,000 lb.
Wt., engine, 254,000 lb.
H't'g. surface, 2,564 sq. ft.
Superheater, 680 sq. ft.
Grate, 63 sq. ft.
Tr. force, 55,500 lb. (70 per cent c.o.)
Tr. force, booster, 69,500.



Eight-Wheel Switcher Built for the Oliver Iron Mining Company by the Lima Locomotive Works, Inc.



Pressure, 205 lb.
Drivers, 80 in.
Cyls., 27 in. by 28 in.
Wt., drivers, 201,580 lb.
Wt., engine, 316,510 lb.
H't'g. surface, 4,058 sq. ft.
Superheater, 962 sq. ft.
Grate, 70 sq. ft.
Tr. force, 44,460 lb.

Pennsylvania 4-6-2 Type Built by the Baldwin Locomotive Works

Export

Purchaser	No.	Type	Service	Length Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Amer. R. R. of Porto Rico	1	2-8-0	Frt.	.....	.....	.....	July	.....	Baldwin
Amtorg Trading Co.	3	0-4-0	....	81,000	.....	14 x 22	August	.....	American
Bwana M'Kubwa Copper Co.	1	2-6-2	....	103,000	.....	15 x 20	.....	.....	American
Fajardo Development Co.	1	2-8-0	....	90,000	.....	16 x 20	.....	.....	American
Ferrocarril de Antioquia	1	2-8-0	....	85,000	.....	16 x 20	May	.....	American
	1	2-8-2	....	.....	.....	.....	March	.....	Baldwin
	2	2-8-2	....	.....	.....	.....	April	.....	Baldwin
	10	4-8-0	....	.....	.....	.....	October	.....	Baldwin
Manila Railroad	3	4-6-2	....	.....	.....	3-cyl.	June	.....	Baldwin
Mukden Railway	1	2-8-2	....	190,000	.....	20 x 28	.....	.....	American
	2	2-8-2	....	190,000	.....	20 x 28	.....	.....	American
	4	2-6-0	....	.....	.....	.....	March	.....	Baldwin
	4	2-8-2	....	.....	.....	.....	September	.....	Baldwin
Peruvian Government	1	2-8-2	....	127,000	.....	19 x 20	.....	.....	American
	2	2-8-2	....	.....	.....	.....	June	.....	Baldwin
	2	2-8-2	....	.....	.....	.....	June	.....	Baldwin
Sorocobana	10	4-8-2	....	199,000	.....	18½x24&22-3cyl.	.....	.....	American
Usina Jaqueira	1	2-8-0	....	85,000	.....	16 x 20	.....	.....	American

Oil-Electric, Diesel, or Gasoline Locomotives

Purchaser	No.	Wheel arrangement	Type	Weight	Tractive force	Cylinders No. Dia. and Stroke	Builders
Alaska	1	.....	Gasoline	48,000	.....	.....	Plymouth
American Rolling Mill Co.	1	.....	Oil-Electric	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Anaconda Copper Mining Co.	1	0-4-0	Oil-Electric	47,000	.....	.....	Westinghouse-Baldwin
Boston & Maine	1	4-8-4	Diesel	314,000	50,000	6	Krupp (Ger.)
Chicago & Northwestern	1	.....	Oil-Electric	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Erie	2	0-4-4-0	Oil-Electric	130,000	40,000	.....	Ingersoll Rand-Amer.-Gen. Elec.
Live Poultry Transit Co.	1	.....	Gasoline	65,000	.....	.....	.....
Long Island	1	0-8-0	Oil-Electric	200,000	60,000	.....	Ingersoll Rand-Amer.-Gen. Elec.
	1	0-8-0	Oil-Electric	200,000	60,000	.....	Westinghouse-Baldwin
N. Y., N. H. & Hartford	1	.....	Oil-Electric	40,000	.....	6-6x7	Fate-Root-Heath
Reading Company	1	.....	Oil-Electric	.....	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Union Carbide Co.	1	.....	Oil-Electric	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.

Electric Locomotives

Purchaser	No.	Wheel arrangement	Service	Weight	Tractive force	Voltage	Date of order	Date of delivery	Builder
Chicago, North Shore & Milwaukee	2	0-4-4-0	.....	.....	.....	.....	.....	.....	General Electric
Chicago, So. Shore & So. Bend	2	0-4-0	Switching	106,000	13,000	.....	March	May	Westinghouse-Bald-
	3	0-4-0	Freight	160,000	30,400	.....	September	February	Westinghouse-Bald-
Great Northern	2	2-6-6-2	Frt. & Pass.	518,250	123,000	.....	June	August '28	Amer-Gen'l Elec.
	2	2-8-2+2-8-2	Frt. & Pass.	715,400	137,400	.....	June	September '28	Westinghouse-Bald.
Houston Nor. Shore	1	0-4-0	Freight	100,000	98,000	600	February	.....	Westinghouse
Long Island	15	.....	Pass.	313,000	50,000	.....	January	December	Company Shops
	1	.....	Sw.	50,000	12,500	.....	January	December	Westinghouse-Bald.
N. Y., N. H. & Hartford	5	.....	Pass.	362,000	52,500	.....	May	November	Westinghouse
New York State Railways	1	0-4-4-0	.....	.....	.....	.....	.....	.....	General Electric
Red River Lumber Co.	2	0-4-0	Freight	122,625	15,000	1,500	March	August	General Electric
Utah Copper	1	0-4-4-0	Freight	170,000	34,400	.....	September	May	General Electric

Canada

Montreal & So. Counties	1	0-4-4-0	Freight	120,000	42,000	.....	December	March	Canadian

Export

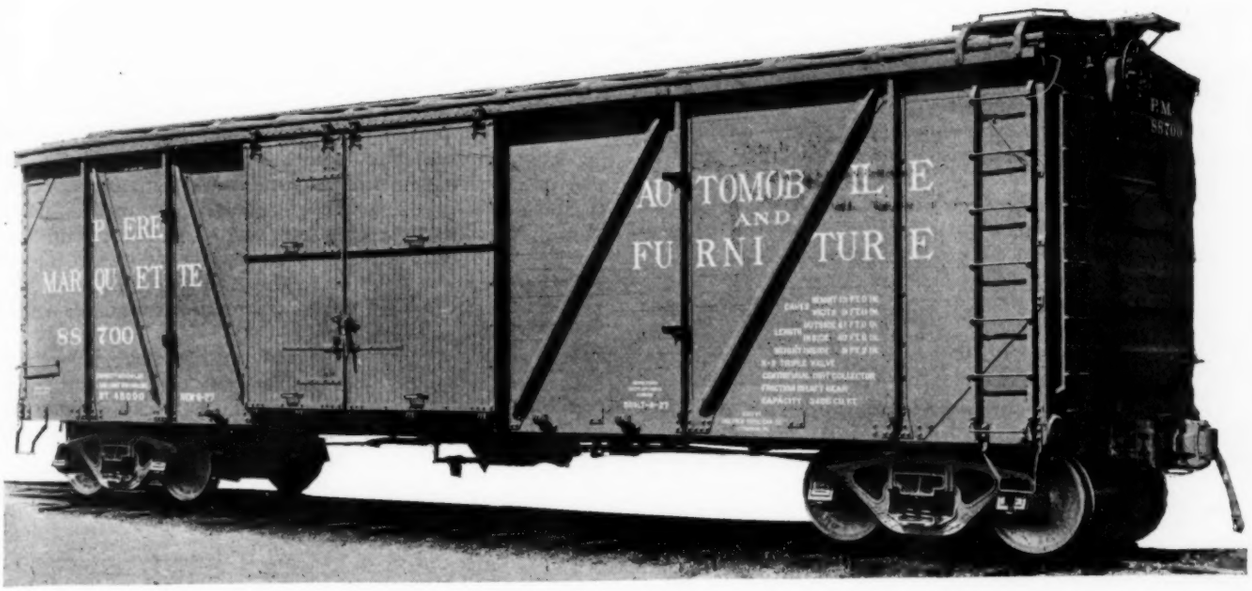
Purchaser		Wheel arrangement	Service	Weight	Tractive force	Voltage	Date of order	Date of delivery	Builder
Anglo Chilean Nitrate Co.	2	0-4-4-0	.....	.....	.....	.....	.....	.....	General Electric
Bethlehem Chile Copper Co.	1	0-4-4-0	.....	.....	.....	.....	.....	.....	General Electric
Hershey Cuban Co.	1	0-4-4-0	.....	.....	.....	.....	.....	.....	General Electric

View of Supply Field

(*Continued from page* 16)

would practically prohibit or drastically limit their use. . . . Millions upon millions of dollars have been expended for which the inventors and promoters never received any return." Many successful devices so developed, he said, have saved the roads vast amounts of money: "It will be a sorry day, therefore, when the railroads conclude to limit themselves to devices which can be developed and produced on their own properties and in their own shops." Discussing the need of better accounting by which to compare railway shop cost with contract price in reclamation of material and in rebuilding equipment, Mr. Wright bespoke for the manufacturers "the privilege of being allowed to demonstrate their ability to serve the railroads better than the latter can serve themselves." Our association has refrained from adopting any resolutions on the subject of railway manufacture, but we have had no hesitation in creating facilities through which others may keep before all concerned at this time of impending unifications the aspect described in a statement made last May to our organization by Interstate Commerce Commissioner McManamy: "Alike as a dependable source of standard supplies and as a promising source of inventions and progress, the railway supply industry is indispensable to the future development of our railways."

Economy through progress is the handmaiden of sound and endurable rate regulation. Acceptable rate regulation is the price the country must pay for satisfactory transportation and hence for the preservation of private ownership and operation. Investment in cost saving apparatus is the key to moderation in freight rates. Whatever we do in the coming months toward opening all eyes to this truth will lay the foundation for broad and far-seeing wisdom in business, in transportation and government. This holds a stake for all of us; not merely a stake in saving certain ways of doing business but a stake in keeping the government out of transportation and out of business. So it comes about that immediate opportunity, the opportunity of 1928 for our industry to work with the railways in cost reduction through progress and modernization, is also our long-range opportunity.



Steel Underframe, Single Sheathed Automobile and Furniture Car Built for the Pere Marquette by the Pressed Steel Car Company

Freight Car Orders in 1927

Total for the year is higher than in 1926, *but is below normal—Canada orders more*

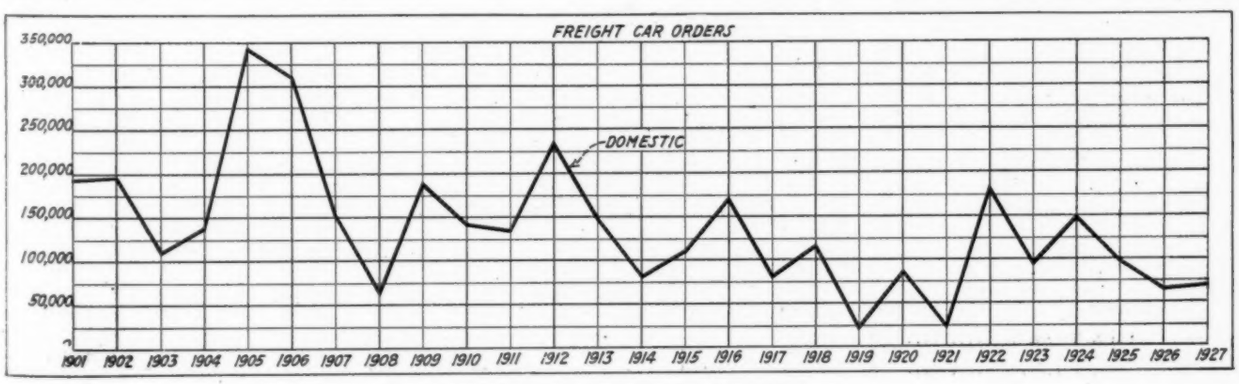
By F. W. Kraeger,
Associate Editor, *Railway Age*

THE number of freight cars ordered in 1927 for service in the United States was 72,006, or 4,977 more than in 1926. While surpassing those placed in 1926, cars ordered in 1927 were at a point where but few other years since 1901 were lower,—the two abnormally poor years of 1919 and 1921, the year, 1908 when 62,669 cars were ordered, and, as was indicated, 1926 when 67,029 cars were ordered. Orders placed in 1925 were 92,816, and in 1924 were 143,728.

The freight cars ordered by Canadian railroads in 1927 for service in Canada amounted to 2,133, or about 500 more than were ordered in 1926, and the highest total since 1923.

Export orders of freight cars amounted to 646 in contrast to 1,971 in 1926, making 1927 one of the lowest years for export orders of freight cars.

The total number of freight cars built in 1927 for service in the United States was 63,390 as compared with 88,862 in 1926. The number built in 1927 for domestic use was about on a par with the number built in 1920, and was below that of any year since, except 1921 when only 40,292 were built and 1904 when 60,955 were built. These figures should not be confused with the orders placed. Nor should the total number of cars built be compared with the installation of cars, reported in the statistics issued monthly by the Car Service division of the American Railway Association, as that report included only installations on Class I roads, while the *Railway Age* figures include the production of all cars for the railroads, as well as private car lines. The *Railway Age* totals include only new cars or those having new bodies, whereas the Car



Freight Car Orders, 1901 to 1927

Service division totals include leased and in prior years have included rebuilt cars.

In this report a year ago a position was taken that freight car buying for 1926 had been a disappointment to the car building industry and there is not a great deal to add to that, following a year when buying improved only 5,000 cars over what was a "disappointing year."

As is true of locomotive buying, purchases of freight cars have no doubt been influenced to a considerable degree by increased efficiency of railway operation. It is no longer necessary to go out and buy cars to handle increases in freight traffic in the same degree that was formerly necessary. This is the result of improved freight car utilization resulting largely from the activity of the Car Service Division and the carrying out of the program adopted in 1923 for improved operating efficiency. However, with all that was gained through increased efficiency, it cannot be definitely said that enough has been gained to account for the decrease in buying of freight cars in the last two years. It seems not unlikely that a good deal of the decrease in orders was due to it, but also the decline in purchases under more normal years was due to hesitancy on the part of railroads, a hesitancy that might well be attributable to a desire to delay for a time until the effect of increased efficiency on annual car requirements can be more accurately determined. With successive years of comparatively few orders placed, opinion in many quarters is that it would seem nearly time for a reaction to set in.

The following tables contain a detailed statement of orders placed for new freight cars with the builders during 1926 by the railroads and industrial companies; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other owners of cars, in response to requests for this information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The figures of production were secured in response to requests made to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute in securing the reports of the companies affiliated with that organization.

In last year's annual review number the following statement appeared: "The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. It feels that such accuracy would be next to impossible, in view of the short space of time permitted for the compilations due to the desirability of having the results available at the close of the year with which they deal. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly as concerns comparison with preceding years, which, after all, is the primary purpose of the compilations."

Table I—Freight Car Orders in 1927

For service in the United States	72,006
For service in Canada	2,133
For export to other countries	646
Grand total	74,785

Table II—Orders for Freight Cars Since 1901

Domestic Orders

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	105,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785

Prior to 1918, Canadian orders included in domestic.

Table III—Freight Cars Built in 1927

	United States	Canada	Total
Domestic	63,390	2,851	66,241
Foreign	1,087	.....	1,087
Total	64,477	2,851	67,328

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886
1900	113,070	2,561	115,631
1901	132,591	4,359	136,950
1902	161,747	2,800	162,599
1903	153,195	1,613	152,801
1904	60,955	1,995	60,806
1905*	162,701	5,305	165,155
1906*	236,451	7,219	240,503
1907*	280,216	9,429	284,188
1908*	75,344	1,211	76,555
1909*	91,077	2,493	93,570
1910*	176,374	4,571	180,945
1911*	68,961	3,200	72,161
1912†	148,357	4,072	152,429

*Includes Canadian output.
†Includes Canadian output and equipment built in company shops.

	United States			Canadian			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1913	176,049	9,618	185,667	22,017	.....	22,017	207,684
1914	97,626	462	98,088	6,453	.....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	.....	.....	5,580	135,001
1917	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918	67,062	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,783	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	.....	.....	.....	.....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	.....	.....	.....	.....
1924	113,761	1,141	114,902	1,721	.....	1,721	116,623
1925	105,935	3,010	108,945	.....	.....	.....	.....
1926	88,862	2,771	91,633	1,645	.....	1,645	93,278
1927	63,390	1,087	64,477	2,851	.....	2,851	67,328

Table IV is tabulation of orders.

Freight Car Orders in 1927

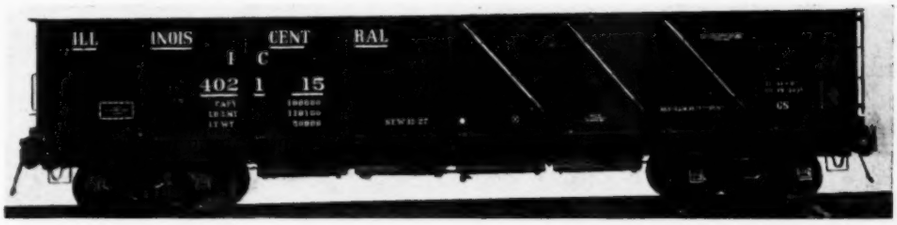
For Service in the United States

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Akron, Canton & Young	1	Box	80,000	36	0	St. Und'frame	31,600	January	June	Company Shops
	1	Box	80,000	40	0	St. Und'frame	34,000	January	March	Company Shops
Alaska	1	Air Dump	100,000	.....		All Steel	74,800	June	September	W. Wh. Scraper
.....	7	.....	.....	.....		.....	.....	.....	.....	Company Shops
Amer. Agricultural Chem. Co.	3	Tank	100,000	.....		.....	.....	November	.....	Gen. Amer. Tank

Capacity, 50 tons
Light weight, 39,600 lb.
Load limit, 129,400 lb.
Built, February, 1927

50-Ton Flat Car Built by the Bettendorf Company

Capacity, 50 tons
Light weight, 50,900 lb.
Load limit, 118,100 lb.
Inside length, 41 ft.
Cubic capacity, 2,035 cu. ft.
Built, October, 1927

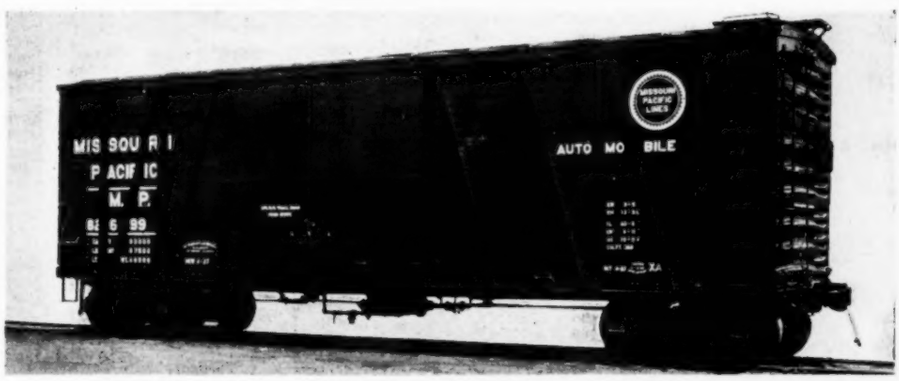


Composite Drop Bottom Gondola Built by the Illinois Car & Manufacturing Company

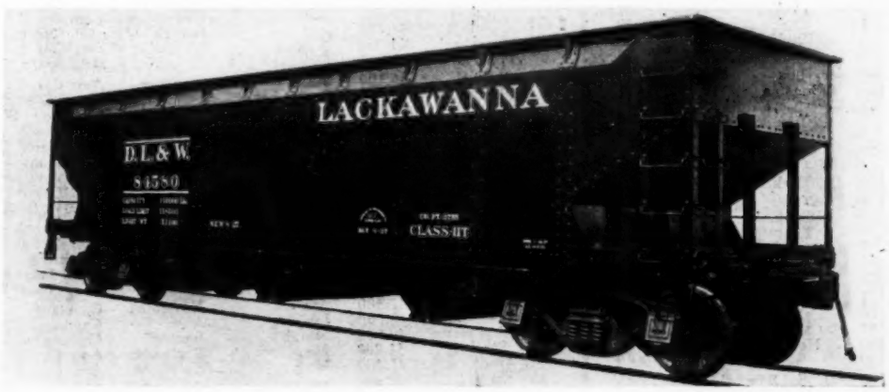
Capacity, 50 tons
Light weight, 46,300 lb.
Load limit, 122,700 lb.
Inside length, 33 ft. 1⅞ in.
Built, July, 1927

Roger Ballast Car Built by the American Car & Foundry Company

Capacity, 40 tons
Light weight, 48,500 lb.
Load limit, 87,500 lb.
Inside length, 40 ft. 6 in.
Inside width, 8 ft. 11 in.
Inside height, 10 ft.
Built, April, 1927



Single Sheathed Automobile Car Built by the Mt. Vernon Car Manufacturing Company



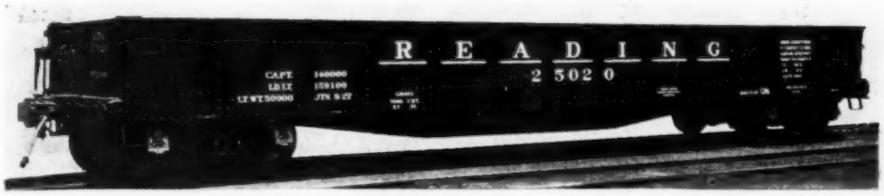
Capacity, 70 tons
Light weight, 51,100 lb.
Load limit, 158,900 lb.
Inside length, 40 ft.
Inside width, 10 ft. 1 in.
Built, August, 1927

All-Steel Hopper Car Built by the American Car & Foundry Company

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Armstrong Cork Co.	7	Tank	10,000	28	0	Steel	50,300	August	October	Am. Car & Fdy.
Atchison, Topeka & Santa Fe	500	Refrigerator	80,000	40		Steel Frame	56,300	May	August	Am. Car & Fdy.
	500	Refrigerator	80,000	40		Steel Frame	56,400	January	June	Pullman
	500	Box	100,000	40	6	Steel Frame	47,000	January	May	Pullman
	500	Box	100,800	40	6	Steel Frame	46,900	May	June	Gen. Amer. Car
	500	Box	100,000	40	6	Steel Frame	46,600	April	June	Standard Steel
	300	Gondola	100,000	40		Steel Frame	50,000	March	April	Am. Car & Fdy.
	150	Sulphur	140,000	40		Steel Frame	53,500	April	July	Am. Car & Fdy.
	50	Ballast	100,000	33		All Steel	48,300	March	August	Pressed Steel
	50	Ballast	100,000	30	6	All Steel	47,400	April	June	Rodger Ballast
	150	Caboose	100,000	28	4	All Steel	47,100	August	October	Am. Car & Fdy
	750	Stock	.....	.....		.....	.....	December	.....	Penn. Tank Car
	500	Gondola	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
	300	Flat	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
	500	Refrigerator	.....	.....		.....	.....	December	.....	Pullman
	500	Box	.....	.....		.....	.....	December	.....	Pullman
	500	Auto	.....	.....		.....	.....	December	.....	Gen. Amer. Car
	500	Box	.....	.....		.....	.....	December	.....	Mt. Vernon Car
	100	Ballast	.....	.....		.....	.....	December	.....	Rodger Ballast
Atlantic Refining Co.	9	Tank	9,725g	34	4	All Steel	53 000	August	October	Standard Steel
Baltimore & Ohio	1,000	Gondola	140,000	41	3	All Steel	53,200	January	May	Balt. Car & F
	1,000	Gondola	140,000	41	3	All Steel	53,200	January	April	Bethlehem Steel
	500	Box	100,000	40	6	All Steel	48,600	January	July	Am. Car & Fdy.
	500	Box	100,000	40	6	All Steel	48,600	January	June	Pressed Steel
	100	Caboose	.....	.....		.....	.....	January	June	Company Shops
Bangor & Aroostook	100	S. S. Box	80,000	40	4½	Steel Frame	42,200	February	November	Company Shops
Barber Asphalt Co.	200	Tank	10,000g	.....		.....	.....	January	.....	Gen. Amer. Tank
Boston & Albany	5	Well	164,000	36	6½	All Steel	68,800	June	December	Standard Steel
	9	Flat	184,000	34	0	All Steel	46,000	June	December	Standard Steel
	1	Flat	.....	.....		.....	.....	.....	.....	Company Shops
Boston & Maine	6	Air Dump	30 cu. yd.	34	0	All Steel	61,100	April	May	Magor
Brown & Sites Co.	1	Flat	70 Tons	44		St. Und'frame	54,900	February	August	Magor
Brown Co.	3	Tank	30,000	.....		All Steel	.....	November	December	Am. Car & Fdy.
Calco Chemical Co.	1	Tank	15 Tons	42	3	Steel	30,100	October	November	Am. Car & Fdy.
Canfield Oil Co.	5	Tank	8,000	28	0	Steel	42,000	January	February	Am. Car & Fdy.
Carnegie Steel Co.	4	Flat	140,000	46	9¼	St. Und'frame	45,000	November	.....	T. C. I. & R.R.
	40	Tank	125,000g.	33		All Steel	51,200	September	December	Am. Car & Fdy.
	8	Hopper	150,000	.....		.....	.....	January	.....	Am. Car & Fdy.
Central Alloy Steel	1	Air Dump	30 cu. yd.	33	3	Steel	77,800	October	October	Pressed Steel
Central of Georgia	10	Caboose	.....	.....		.....	.....	.....	.....	Company Shops
	3	Work	.....	.....		.....	.....	.....	.....	Company Shops
Central Supply Co.	2	Caboose	.....	29	2	St. Und'frame	40,000	February	June	Standard Steel
Chesapeake & Ohio	200	Gondola	140,000	39	0	Steel Frame	50,000	Nov., '26	Feb.-March	Richmond Car
	200	Gondola	140,000	39	0	Steel Frame	50,000	January	April	Richmond Car
	250	Gondola	140,000	39	0	Steel Frame	50,000	March	May-June	Richmond Car
	250	Gondola	140,000	39	0	Steel Frame	50,000	March	June-July	Am. Car & Fdy.
Chicago & Eastern Illinois	1,067	Gondola	110,000	40	9¾	St. Und'frame	47,700	January	Jan. Nov.	Company Shops
Chicago & Illinois Midland	4	Caboose	.....	28	0	St. Und'frame	40,400	May	October	Am. Car & Fdy.
	350	Coal	140,000	46	6	Steel	55,000	June	.....	Pullman
Chicago & North Western	500	S. S. Box	100,000	40	6	Steel Frame	.....	July	October	Gen. Amer. Tank
	25	Caboose	.....	29	4¾	St. Und'frame	.....	November	March	Am. Car & Fdy.
	500	Hopper	140,000	39	0	All Steel	48,300	February	June	Pressed Steel
	250	Hopper	140,000	31	11	All Steel	.....	November	1928	Standard Steel
	1,335	Box	.....	.....		.....	.....	March	.....	Company Shops
	1,000	Box	.....	.....		.....	.....	February	.....	Company Shops
	100	Gondola	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
	91	Stock	80,000	36	6	Steel Frame	40,000	January	March	Illinois Car
	250	Hopper	140,000	39	0	All Steel	43,500	December	April	Illinois Car
	500	Hopper	140,000	39	0	All Steel	54,500	December	.....	Pullman
	2	Flat	140,000	36	7½	All Steel	69,000	November	February	Company Shops
	500	Flat	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
Chicago, Burlington & Quincy	200	Ballast	100,000	33	1⅞	Steel	46,400	February	July	Am. Car & Fdy.
	500	Auto	80,000	40	6	Steel Frame	47,200	February	August	Pressed Steel
	500	Box	.....	.....		.....	46,600	February	.....	Pullman
	1,000	Gondola	.....	.....		.....	.....	January	.....	Company Shops
	500	Hopper	110,000	34	3	All Steel	45,000	September	March	Company Shops
	250	Stock	60,000	36	0	Steel Frame	34,100	January	February	Company Shops
Chicago, North Shore & Milwaukee	10	Flat	80,000	60	0	All Steel	50,000	March	August	Standard Steel
Chic., Rock Island & Pacific	250	Flat	100,000	43	0	Steel Frame	38,100	February	May	Ryan
	500	Box	80,000	40	1⅜	St. Und'frame	43,900	January	July	Am. Car & Fdy.
	100	Gondola	10,000	41	0	St. Und'frame	48,500	July	December	Am. Car & Fdy.
	250	Ballast	100,000	33	0	All Steel	48,200	January	June	Pressed Steel
	500	Box	80,000	42	1	St. Und'frame	49,000	January	June	Standard Steel
	500	Box	.....	.....		.....	.....	January	.....	Bettendorf
	500	Coal	.....	.....		.....	.....	January	.....	Bettendorf
	400	.....	.....	.....		.....	.....	.....	.....	Company Shops
Chicago, St. P., Minn. & Om.	250	Gondola	100,000	41	0	All Steel	41,000	November	March	Siems-Stembel
	500	S.S. Box	100,000	40	6	Steel Frame	45,600	July	November	Standard Steel
Chic., So. Shore & So. Bend	4	Caboose	.....	29	4	Steel Frame	33,200	October	December	Am. Car & Fdy.
	6	Flat	80,000	60	0	All Steel	.....	March	August	Standard Steel
Chicago Tank Car Co.	30	Tank	8,000	28	0	Steel	44,300	November	December	Am. Car & Fdy.
Cities Service Tank	1	Tank	6,000	27	0	Steel	40,700	July	September	Am. Car & Fdy.
	1	Tank	8,000	28	0	Steel	44,300	July	September	Am. Car & Fdy.
	100	Tank	8,000	28	0	Steel	44,300	August	November	Am. Car & Fdy.
	50	Tank	.....	.....		.....	.....	February	.....	Gen. Amer. Tank
Clev., Cinn., Chi. & St. L.	1,000	Box	110,000	40	6	All Steel	46,100	May	Aug.-Oct.	Am. Car & Fdy.
	500	Gondola	110,000	41	6	All Steel	43,500	September	Sept.-Dec.	Merch. Despatch
	25	Caboose	.....	.....		.....	.....	.....	.....	Company Shops
Clinton & Oklahoma Western	10	Box	80,000	40	6	St. Und'frame	43,100	March	May	Am. Car & Fdy.
	10	Box	80,000	40	7½	St. Und'frame	42,400	June	September	Am. Car & Fdy.
Conley Tank Car Co.	12	Tank	60,000	.....		All Steel	40,000	July	October	Pet. Iron Wks.
	4	Tank	80,000	.....		All Steel	38,000	November	December	Pet. Iron Wks.
	100	Tank	100,000	.....		All Steel	45,000	November	January	Am. Car & Fdy.
Continental Tank Car Co.	2	Tank	80,000	.....		All Steel	40,300	May	June	Pet. Iron Wks.
Cook Paint & Varnish Co.	1	Tank	4,000	25	0	Steel	36,000	March	July	Am. Car & Fdy.
	1	Tank	6,000	27	0	Steel	42,800	March	May	Am. Car & Fdy.
Corn Products Co.	1	Ex. Side Dump	.....	.....		.....	.....	July	.....	Clark Car
Cornwall	20	Hopper	150,000	19	10	All Steel	41,850	April	July	Bethlehem Steel
Crew Levick Co.	50	Tank	100,000	.....		All Steel	45,800	February	March	Gen. Amer. Tank
Delaware & Hudson	1	S. S. Box	100,000	40	6	Steel Frame	47,500	April	November	Company Shops
Delaware, Lackawanna & Western	10	Caboose	.....	24	3	St. Und'frame	40,000	January	April	Company Shops
	10	Caboose	.....	24	3	St. Und'frame	40,000	March	September	Company Shops
	300	Hopper	140,000	40	0	Steel	51,200	May	September	Am. Car & Fdy.
	300	D. S. Box	110,000	40	8	St. Und'frame	45,300	May	September	Am. Car & Fdy.
	200	D. S. Box	110,000	40	8	St. Und'frame	45,300	May	September	Magor
	50	Stock	80,000	40	8	St. Und'frame	41,300	January	April	Company Shops
	25	Ballast	100,000	.....		St. Und'frame	44,800	.....	.....	Am. Car & Fdy.

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Denver & Rio Grande West	300	D. S. Box	100,000	50	0	Steel Frame	57,600	April	June-July	Mt. Vernon
Denver & Salt Lake	6	Air Dump	30 cu. yd.	.....		All Steel	.....	July	.....	W. Wh. Scraper
Detroit Edison Co.	4	Gondola	100,000	35	11½	All Steel	40,500	April	June	Pressed Steel
Dick Construction Co.	12	Dump	.....	.....		.....	.....	March	.....	Am. Car & Fdy.
Dow Chemical Co.	4	Tank	10,000	28	0	Steel	44,200	February	April	Am. Car & Fdy.
Duluth, Missabe & Northern	125	Ore	162,000	19	7⅞	All Steel	47,800	July	Feb.-Mar.	Standard Steel
	125	Ore	162,000	19	7⅞	All Steel	47,200	July	Feb.-Mar.	Gen. Amer. Car
Du Pont, E. I., de Nemours, Corp.	6	Box	.....	22	3	St. Und'frame	18,000	September	November	Am. Car & Fdy.
East Broad Top	16	Hopper	70,000	.....		All Steel	26,000	.....	Jan.-June	Company Shops
Eastman Kodak Co.	1	Tank	8,000g.	.....		.....	.....	March	.....	Gen. Amer. Tank
East Side Packing Co.	65	Refrigerator	80,000	36	0	Steel Frame	57,400	April	Apr.-Nov.	E'g'sh Car Mfg.
East Tenn. & West. N. C.	3	.....	.....	.....		.....	.....	.....	.....	Company Shops
Ft. Worth & Denver	100	Ballast	100,000	33	1⅞	Steel	46,400	February	July	Am. Car & Fdy.
	2	Air Dump	.....	.....		Steel	.....	July	.....	W. Wh. Scraper
Freedom Oil Works	2	Tank	4,500	28	0	Steel	36,400	March	May	Am. Car & Fdy.
	3	Tank	5,000	28	0	Steel	39,700	March	May	Am. Car & Fdy.
Fruit Growers' Express	100	Refrigerator	60,000	32	6	St. Cent. Sills	52,000	February	.....	Company Shops
	300	Refrigerator	60,000	32	6	St. Cent. Sills	52,000	April	.....	Company Shops
	1	Refrigerator	60,000	32	6	St. Cent. Sills	52,000	January	.....	Company Shops
	10	Refrigerator	60,000	32	6	St. Cent. Sills	52,000	January	.....	Company Shops
	5	Refrigerator	60,000	32	6	St. Cent. Sills	52,000	January	.....	Company Shops
	812	Refrigerator	90,000	33	2¾	St. Und'frame	56,000	September	.....	Company Shops
	350	Refrigerator	90,000	33	2¾	St. Und'frame	56,000	April	.....	Company Shops
General Electric Co.	10	Flat	100,000	36	0	St. Und'frame	....	March	June	Am. Car & Fdy.
Georgia & Florida	60	S. S. Box	80,000	40	6	St. Und'frame	42,000	June	September	Am. Car & Fdy.
Gillespie, L. C. & Sons	3	Tank	100,000	.....		All Steel	42,000	March	March	Am. Car & Fdy.
Goodwin & Gallagher Corp.	8	Hopper	20 cu. yd.	21	4	All Steel	26,460	January	March	Magor
Grand Trunk Western	1,000	Auto	80,000	40	6	Steel Frame	47,500	.....	May-July	Pressed Steel
	20	Caboose	.....	29	1	St. Und'frame	41,625	.....	July	Company Shops
	100	Ballast	.....	40	0	Steel	.....	March	August	Rodger Ballast
Grasselli Dyestuff Co.	1	Tank	7,000	28	0	Steel	43,200	May	May	Am. Car & Fdy.
Great Northern	500	S. S. Box	100,000	40	6	Steel Frame	48,200	January	December	Company Shops
	150	Flat	100,000	50	0	All Steel	41,250	January	August	Company Shops
	250	Stock	60,000	36	0	St. Und'frame	.....	October	August, '28	Company Shops
	150	Stock	80,000	36	0	St. Und'frame	.....	October	August	Company Shops
	250	Gondola	140,000	40	0	All Steel	.....	May	November	Pressed Steell
	27	Caboose	.....	24	5	St. Und'frame	35,900	January	August	Company Shops
	25	Caboose	.....	24	5	St. Und'frame	35,900	August	May	Company Shops
	200	Flat	100,000	50	0	All Steel	40,800	August	May	Company Shops
	6	Air Dump	100,000	34	0	All Steel	71,500	March	September	Koppel
Gr. West. Electrochemical Co.	5	Tank	30,000	42	3	Steel	30,100	January	May	Am. Car & Fdy.
Gulf Coast Lines	100	Ballast	100,000	.....		Steel Frame	.....	January	May	Rodger Ballast
	20	Caboose	60,000	.....		St. Und'frame	42,300	January	May	Mt. Vernon Car
Gulf, Mobile & Northern	4	Caboose	.....	.....		.....	.....	.....	.....	Company Shops
	12	Air Dump	30 cu. yds	.....		.....	.....	December	.....	Koppel
Guthrie, A., Co.	6	Air Dump	30 cu. yd.	33	0	Steel	75,000	May	May	Pressed Steel
Hoffman, Michael, Fuel Co.	1	Tank	10,000g.	.....		.....	.....	August	.....	Gen. Amer.
Illinois Central	500	Flat	100,000	40	8	St. Und'frame	36,300	June	Oct.-Nov.	Bettendorf
	500	Box	80,000	40	6	St. Und'frame	46,900	June	Oct.-Nov.	Mt. Vernon Car
	500	Box	80,000	40	6	St. Und'frame	46,600	June	October	Pullman
	500	Auto-Furn.	80,000	40	6	St. Und'frame	49,600	June	Oct.-Nov.	Pressed Steel
	500	Auto-Furn.	80,000	40	6	St. Und'frame	49,800	June	Nov.-Dec.	Gen. Amer. Car
	500	Gondola	100,000	41	0	St. Und'frame	50,800	June	Oct.-Nov.	Ill. Car & Mfg.
	500	Gondola	100,000	41	0	St. Und'frame	51,100	June	Oct.-Nov.	Am. Car & Fdy.
	700	Hopper	100,000	34	9	All Steel	47,300	June	Nov.-Dec.	Standard Steel
	300	Hopper	140,000	41	3	All Steel	56,500	June	Nov.-Dec.	Pullman
Illinois Traction	200	Gondola	100,000	40	6	St. Und'frame	48,600	August	January	Am. Car & Fdy.
	50	Gondola	100,000	40	6	St. Und'frame	48,600	August	January	Am. Car & Fdy.
Independent Oil & Gas Co.	50	Tank	80,000	36	0	All Steel	.....	February	May	Standard Tank
International-Great Northern	500	S. S. Box	80,000	.....		Steel Frame	44,000	January	April-May	Am. Car & Fdy.
	100	Gondola	100,000	40	0	Steel Frame	43,500	January	April-May	Mt. Vernon Car
Kanawha, Gl. J. & Eastern	2	Flat	100,000	40	0	.....	.....	December	.....	Am. Car & Fdy.
Kansas City, Mexico & Orient	210	.....	.....	.....		.....	.....	.....	.....	Company Shops
Kansas City Southern	7	Cinder	100,000	24	5	St. Und'frame	34,000	August	.....	Company Shops
	6	Work	.....	.....		.....	.....	.....	.....	Company Shops
Klasing Car Brake Co.	1	D. S. Box	100,000	40	6	Steel Frame	.....	February	May	.....
Lehigh & New England	200	S. S. Box	100,000	40	6	All Steel	46,100	July	October	Pressed Steel
Lehigh Coal & Navigation Co.	1	Ex. Side Dump	.....	90	0	.....	.....	October	.....	Clark Car
	4	Ex. Side dump	30 cu. yds	.....		.....	.....	December	.....	Clark Car
Lehigh Valley	1	Hopper	140,000	40	0	All Steel	51,100	April	July	Standard Steel
	1	Hopper	140,000	42	0	All Steel	51,700	June	June	Am. Car & Fdy.
Litchfield & Madison	100	Gondola	100,000	41	6	St. Und'frame	44,100	June	September	Am. Car & Fdy.
	147	Gondola	100,000	41	6	St. Und'frame	41,500	June	September	Am. Car & Fdy.
Louisiana & Arkansas	8	Flat	80,000	.....		St. Und'frame	.....	October	.....	Am. Car & Fdy.
Louisiana & Northwest	7	.....	.....	.....		.....	.....	.....	.....	Company Shops
Louisville & Nashville	1,250	Gondola	100,000	40	6	All Steel	43,500	.....	.....	Pressed Steel
	200	Gondola	100,000	45	0	St. Und'frame	48,000	.....	.....	Mt. Vernon
	200	Stock	80,000	40	6	St. Und'frame	42,500	.....	.....	Mt. Vernon
	200	Auto	100,000	40	6	St. Und'frame	48,600	.....	.....	Mt. Vernon
	300	S.S. Box	100,000	30	6	St. Und'frame	44,500	.....	.....	Mt. Vernon
Luzerne County Gas & Electric Co.	1	Ex. Side Dump	30 cu. yd.	.....		.....	.....	December	.....	Clark Car
Maryland & Pennsylvania	27	.....	.....	.....		.....	.....	.....	.....	Company Shops
Maryland Slag Company	2	Ex. Side dump	30 cu. yd.	.....		.....	.....	.....	.....	Clark Car
Mathieson Alkali Corp.	2	Tank	100,000	38	8	Steel	87,400	April	July	Am. Car & Fdy.
	10	Tank	15 Tons	28	10½	Steel	43,700	June	July	Am. Car & Fdy.
Merchants Despatch, Inc.	750	Rerigerator	70,000	41	4¾	St. Und'frame	56,600	June	September	Company Shops
Metal & Thermit Corp.	1	Tank	.....	.....		.....	.....	December	.....	Gen.Amer. Tank
Mexican Petroleum Corp.	50	Tank	80,000	28	0	All Steel	44,000	May	May	Am. Car & Fdy.
Michigan Alkali Co.	5	Tank	100,000	.....		All Steel	45,000	June	July	Am. Car & Fdy.
Michigan Central	2	Ballast	.....	32	0	St. Und'frame	29,100	June	September	Rodger Ballast
Michigan Electrochemical Co.	2	Tank	15 Tons	28	10½	Steel	45,900	March	April	Am. Car & Fdy.
Mid-Continent Coal Corp.	10	Gondola	60,000	30	0	Steel	26,200	February	June	Am. Car & Fdy.
Mid-Continent Petroleum Corp.	8	Tank	8,000	28	0	Steel	40,900	March	June	Am. Car & Fdy.
Minneapolis, St. P. & Sault Ste. Marie	150	Gondola	100,000	41	6	Steel Frame	49,200	March	August	Pullman
	100	Gondola	100,000	41	6	Steel Frame	48,700	March	December	Siems-Stembel
Missouri & North Arkansas	30	Coal	160,000	.....		St. Und'frame	.....	.....	.....	Company Shops
Missouri Pacific	750	S. S. Box	80,000	40	0	Steel Frame	.....	January	May-June	Mt. Vernon
	500	Box	80,000	40	6	St. Und'frame	43,100	January	May	Am. Car & Fdy.
	250	Stock	80,000	40	0	St. Und'frame	44,000	January	August	Am. Car & Fdy.
	300	Box	80,000	36	4½	St. Und'frame	43,400	March	July	Am. Car & Fdy.
	750	S. S. Box	100,000	.....		Steel Frame	48,900	January	April-June	Gen'l. Amer. Car
	250	Hopper	110,000	.....		All Steel	41,800	January	April-May	Standard Steel
Mobile & Ohio	200	Hopper	100,000	30	9	Steel Frame	41,200	January	April	T. C. I. & R.R.
		Flat	100,000	41	6	St. Und'frame			June	T. C. I. & R.R.
	250	Gondola	100,000	41	6	St. Und'frame	45,200	January	May	T. C. I. & R.R.
	15	Air Dump	20 cu. yd.						November	Pressed Steel
	9	Caboose	.....	.....		.....	.....	.....	1927	Company Shops

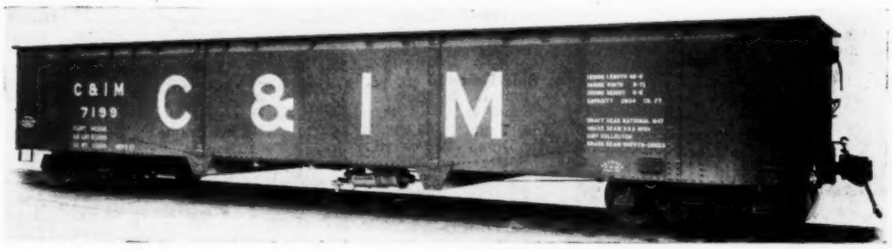
Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Mobile & Ohio (Continued)	250	Box	.....	.....		.....	.....	December	.....	Mt. Vernon Car
	200	Flat	.....	.....		.....	.....	December	.....	Mt. Vernon Car
	250	Gondola	.....	.....		.....	.....	December	.....	Mt. Vernon Car
Monessen S. W. Ry.	6	Tank	7,000	28	0	Steel	40,900	September	November	Am. Car & Fdy.
Montour	1	Air Dump	30 cu. yd.	33	3	Steel	75,800	January	August	Pressed Steel
Morrell, John, & Co.	100	Refrigerator	80,000	39	0½	St. Und'frame	60,560	January	March	Am. Car & Fdy.
New Jersey, Indiana & Ill.	100	Auto-Box	80,000	40	6	St. Und'frame	46,700	May	August	Am. Car & Fdy.
New York Central	500	Gondola	110,000	41	6	All Steel	43,300	March	September	Merch. Dispatch
	950	Hopper	140,000	39	0	All Steel	51,500	May	November	Standard Steel
	50	Hopper	140,000	39	0	All Steel	52,400	May	November	Standard Steel
	500	Gondola	140,000	46	0	All Steel	50,400	May	November	Gen. Am. Car
	5	Spec. Flat	164,000	36	1	Cast Steel	69,000	June	March	Standard Steel
	5	Spec. Flat	184,000	34	0	All Steel	46,000	June	March	Standard Steel
	1,000	D. S. Box	110,000	40	6	All Steel	45,690	June	April	Merch. Despatch
New York, New Haven & Hartford	20	Dump	100,000	32	1⅞	All Steel	57,600	March	March	Clark Car
	4	Caboose	.....	23	3¼	All Steel	38,500	June	December	Osgood-Bradley
	25	Caboose	.....	29	2¾	St. Und'frame	42,500	January	Dec.-Feb.	Company Shops
New York, Ontario & Western	400	Coal	100,000	30	0	Steel Frame	36,000	August	Sept.-Dec.	Bethlehem
Niacet Chemicals Corp.	1	Tank	10,000	128	0	Steel	52,000	May	June	Am. Car & Fdy.
Norfolk & Western	32	Air Dump	.....	.....		.....	.....	February	.....	W. Wh. Scraper
	18	Air Dump	.....	.....		All Steel	.....	February	.....	Clark Car
	250	Auto	.....	.....		All Steel	.....	October	.....	Company Shops
North American Car Corp.	200	Poultry	60,000	36	6	Steel Frame	58,500	January	April	Illinois Car
	100	Refrigerator	80,000	.....		Steel Frame	58,500	May	July	Pressed Steel-B.
	400	Refrigerator	80,000	.....		Steel Frame	54,200	August	November	Pressed Steel-B.
	100	Refrigerator	80,000	.....		Steel Frame	.....	August	December	Pressed Steel-B.
Northern Pacific	300	Gondola	100,000	41	6	Composite	148,900	February	May	Ryan
	200	Dump	100,000	40	0	.....	50,600	March	July-Aug.	Am. Car & Fdy.
	200	Flat	.....	50	0	St. Und'frame	.....	September	.....	Siems Stembel
North Western Refrigerator	1,020	Refrigerator	80,000	39	0⅜	St. Und'frame	54,700	January	May	Am. Car & Fdy.
	14	Refrigerator	.....	.....		.....	.....	.....	.....	Company Shops
Ohio Tank Car	50	Tank	8,000g.	.....		.....	49,000	May	July	Standard Tank
Oliver Iron Mining Co.	35	Air Dump	.....	.....		.....	.....	March	.....	Magor
	20	Air Dump	.....	.....		.....	.....	March	.....	Differential Steel
Otis Steel Co.	3	Ex. Side Dump	.....	90	0	.....	.....	October	.....	Clark Car
Pacific Fruit Exp.	89	Refrigerator	80,000	39	11⅞	Steel Frame	56,400	March	September	Pac. Car & Fdy.
Pacific Gas & Electric Co.	6	Ex. Side Dump	30 cu. yd.	.....		.....	.....	May	.....	Clark Car
Paper Makers' Chemical Co.	1	Tank	8,000	128	0	Steel	42,200	May	June	Am. Car & Fdy.
	1	Tank	8,000	128	0	Steel	42,200	June	July	Am. Car & Fdy.
Pennsylvania	50	Cabin	.....	23	3⅞	All Steel	38,000	March	September	Company Shops
	2	Flat	250,000	.....		All Steel	107,000	March	August	Company Shops
	10	Flat	210,000	.....		All Steel	101,700	May	September	Company Shops
	4	Poling	.....	25	2	All Steel	51,000	March	August	Company Shops
Pennsylvania Salt Mfg. Co.	2	Tank	4,000	25	0	Steel	35,500	April	June	Am. Car & Fdy.
	10	Tank	7,000	28	0	Steel	40,900	August	September	Am. Car & Fdy.
	5	Tank	15 Tons	28	10½	Steel	44,300	September	October	Am. Car & Fdy.
Peoria & Eastern	50	S. S. Box	110,000	40	9	All Steel	45,900	May	September	Am. Car & Fdy.
	50	Gondola	110,000	42	1	All Steel	43,200	June	November	Merch. Despatch
	1	Flat	60,000	38	2	St. Und'frame	28,000	March	April	Company Shops
	1	Flat	80,000	37	0	St. Und'frame	38,600	Sept.	November	Company Shops
Pere Marquette	20	Dump	100,000	31	3	All Steel	77,000	March	June	Koppel
	250	Hopper	140,000	40	0	All Steel	52,000	April	Aug.-Sept.	Standard Steel
	250	Gondola	110,000	42	0	St. Und'frame	48,000	April	Aug.-Sept.	Ill. Car Mfg.
	1,000	S. S. Box	80,000	40	6	St. Und'frame	45,700	April	July-Sept.	Pressed Steel
Philadelphia Quartz Co.	10	Tank	8,000	28	0	Steel	44,300	November	December	Am. Car & Fdy.
Phillips Petroleum Corp.	336	Tank	10,050	36	3	All Steel	47,300	January	Jan.-Feb.	Standard Tank
	200	Tank	8,000	36	8½	All Steel	47,400	April	June-Aug.	Standard Tank
	2	Tank	10,000	40	0	All Steel	89,700	February	March	Standard Tank
	10	Tank	11,000	34	2	All Steel	63,000	August	December	Am. Car & Fdy.
Pittsburgh & Lake Erie	1,000	Gondola	140,000	46	0	All Steel	50,500	April	December	Pressed Steel
Pittsburgh Iron Mining Co.	4	Air Dump	20 cu. yd.	28	0	All Steel	53,800	March	May	Magor
Pittsburgh Prov. & Pack. Co.	4	Refrigerator	80,000	39	0⅜	St. Und'frame	60,560	February	March	Am. Car & Fdy.
Pittsburg, Shawmut & Northern	2	Caboose	.....	.....		St. Und'frame	.....	.....	.....	Company Shops
Quaker City Tank Line, Inc.	384	Tank	.....	.....		.....	.....	.....	.....	Gen. Amer. Tank
Reading	500	Gondola	140,000	46	0	All Steel	50,771	May	Aug.-Sept.	Bethlehem Steel
	500	Gondola	140,000	46	0	All Steel	50,899	May	Sept.-Oct.	Standard Steel
	1	Poling	.....	.....		All Steel	87,800	August	April	Company Shops
	10	Caboose	.....	24	4½	All Steel	44,300	January	Sept.-Oct.	Company Shops
	5	Flat	.....	.....		All Steel	.....	September	July	Company Shops
	5	Air Dump	.....	30	0	All Steel	.....	August	October	Pressed Steel
Roessler & Hasslacher Co.	5	Tank	15 Tons	28	10½	Steel	43,800	June	August	Am. Car & Fdy.
Roxana Petroleum Corp.	50	Tank	80,000	.....		All Steel	47,300	December	January	Am. Car & Fdy.
	6	Tank	8,000	28	0	Steel	40,500	April	May	Am. Car & Fdy.
	6	Tank	10,000	28	0	Steel	44,400	April	May	Am. Car & Fdy.
St. Louis-San Francisco	600	Coal	110,000	.....		.....	.....	.....	.....	Company Shops
Sharples Solvents, Inc.	2	Tank	6,000	27	0	Steel	40,700	October	December	Am. Car & Fdy.
Shell Company of California	1	3 Comp. Tank	80,000	33	3	Steel Frame	51,600	August	November	Gen. Amer. Tank
	3	Tank	100,000	33	3	Steel Frame	52,500	August	November	Gen. Amer. Tank
	11	Ins. Tank	100,000	33	3	Steel Frame	53,500	August	November	Gen. Amer. Tank
	10	Tank	100,000	33	3	Steel Frame	45,000	August	December	Gen. Amer. Tank
Shippers' Car Line	10	Tank	8,000	28	0	Steel	44,600	January	February	Am. Car & Fdy.
	5	Tank	8,000	28	0	Steel	42,800	January	February	Am. Car & Fdy.
	50	Tank	8,000	28	0	Steel	44,000	March	May	Am. Car & Fdy.
	100	Tank	10,000	28	0	Steel	49,200	April	June	Am. Car & Fdy.
	5	Tank	8,000	28	0	Steel	42,100	May	May	Am. Car & Fdy.
	2	Tank	10,000	28	0	Steel	49,200	October	January	Am. Car & Fdy.
Sinclair Refining Co.	150	Tank	10,000	32	6¼	All Steel	51,000	January	Feb.-Mar.	Am. Car & Fdy.
Skelly Oil Co.	70	Tank	8,000	39	0	Steel	49,000	February	July	Am. Car & Fdy.
Solvay Process Co.	3	Tank	15 Tons	42	3	Steel	30,100	September	October	Am. Car & Fdy.
	30	Tank	15 Tons	28	10½	Steel	44,300	September	December	Am. Car & Fdy.
	10	Tank	15 Tons	28	10½	Steel	44,300	November	January	Am. Car & Fdy.
Southern	10	Air Dump	20 cu. yd.	25	8	Steel	53,800	April	July	Pressed Steel
	10	Air Dump	30 cu. yd.	34	0	Steel	73,700	April	May-July	Pressed Steel
	2,000	Hopper	.....	.....		.....	.....	December	.....	Standard Steel
	750	Hopper	.....	.....		.....	.....	December	.....	Mt. Vernon Car
	1,750	Auto	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
	250	Ballast	.....	.....		.....	.....	December	.....	Rodger Ballast
	500	Gondola	.....	.....		.....	.....	December	.....	Company Shops
	250	Caboose	.....	.....		.....	.....	December	.....	Company Shops
Southern Pacific	200	Oil	130,000	.....		All Steel	50,300	March	June-Aug.	Gen. Amer. Tank
	1,000	Gondola	100,000	41	6	All Steel	48,700	March	June-Aug.	Standard Steel
	10	Dump	100,000	32	2	All Steel	58,400	April	July-Aug.	Clark Car
	500	S. S. Box	100,000	40	6	St. F. & Un'F.	43,300	January	Nov.-June	Company Shops
	150	Flat	100,000	40	10	St. F. & Un'F.	34,100	January	July-Nov.	Company Shops
	100	Flat	100,000	50	0	St. F. & Un'F.	41,100	January	July-Nov.	Company Shops
	50	Caboose	60,000	29	7	St. F. & Un'F.	38,800	January	Sept.-Oct.	Company Shops
Southern Pacific, Tex. & N. O.	500	S. S. Box	.....	40	6	Steel Frame	45,600	April	Aug.	Company Shops
Spokane, Portland & Seattle	2	Ex. Side Dump	21 cu. yd.	.....		.....	.....	May	.....	Clark Car



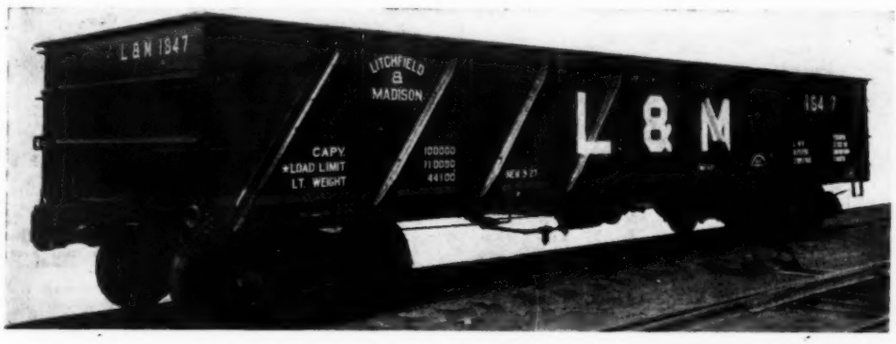
Capacity, 70 tons
Light weight, 50,900 lb.
Loaded limit, 159,100 lb.
Cubic capacity, 1,325 cu. ft.
Inside length, 46 ft.
Inside width, 9 ft. 6 in.
Built, August, 1927

Steel Gondola Built by the Bethlehem Steel Company

Capacity, 70 tons
Light weight, 55,000 lb.
Load limit, 155,000 lb.
Cubic capacity, 2,804 cu. ft.
Inside length, 46 ft. 6 in.
Inside width, 9 ft. 7½ in.
Inside height, 5 ft. 6 in.
Built, August, 1927



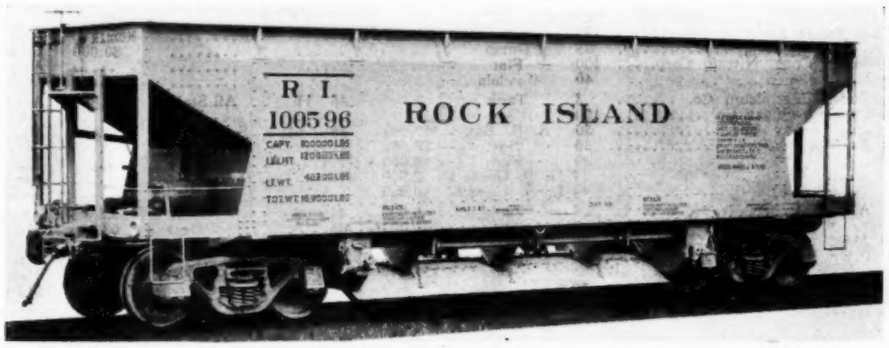
70-Ton Gondola Built by the Pullman Car & Manufacturing Corporation



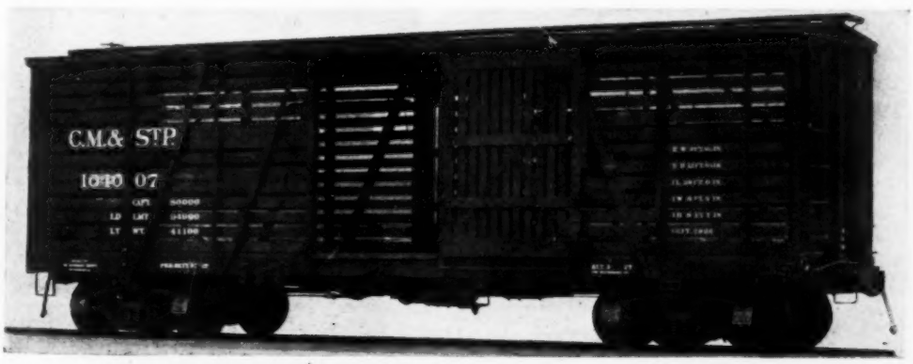
Capacity, 50 tons
Light weight, 44,100 lb.
Load limit, 110,000 lb.
Cubic capacity, 1,750 cu. ft.
Inside length, 41 ft. 6 in.
Inside width, 9 ft. 2 in.
Built, September, 1927

Composite High Side Gondola Built by the American Car & Foundry Company

Capacity, 50 tons
Light weight, 48,200 lb.
Load limit, 120,800 lb.
Cubic capacity, 1,951 cu. ft.
Built, July, 1927



Ballast Car Built by the Pressed Steel Car Company



Capacity, 40 tons
Light weight, 41,100 lb.
Load limit, 94,900 lb.
Inside length, 36 ft.
Inside width, 8 ft. 6 in.
Inside height, 8 ft. 7 in.
Built, March, 1927

Steel Underframe Stock Car Built by the Bettendorf Company

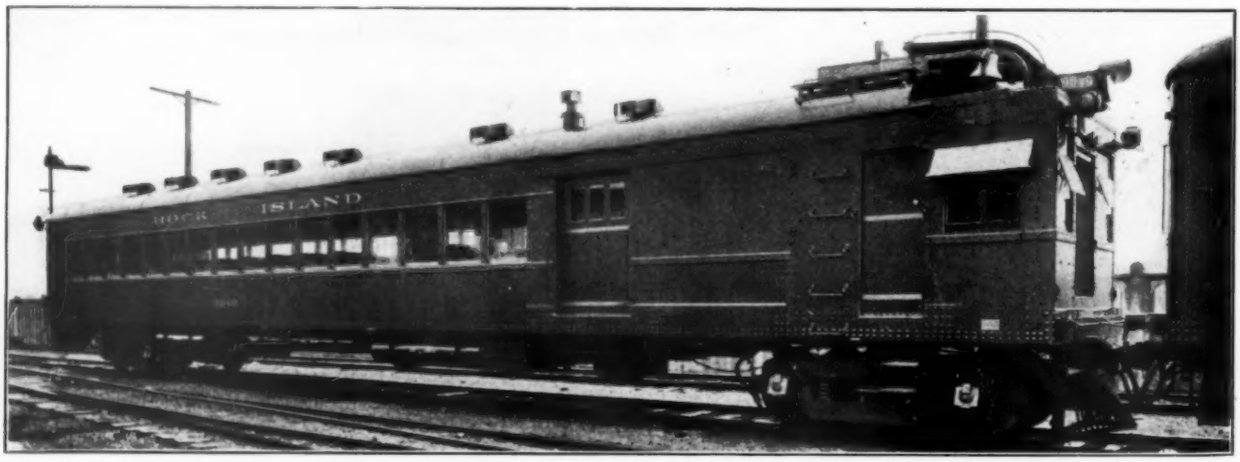
Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Standard Oil Co. of N. J.	10	Box	100,000	40	6	Steel	46,600	March	June	Pressed Steel
Standard Refrigerator Car Co.	114	Refrigerator	80,000	36	0	St. Und'frame	57,400	.....	.....	En'l'sh Car Mfg.
Sterling Products Co.	1	Tank	8,000g.	.....		.....	80,000	November	.....	Gen. Amer. Tan.
Strickland Fdy. & Mach. Works	2	Hopper	20 cu. yd.	21	4	All Steel	26,100	April	August	Magor
Sunlight Coal Co.	10	Air Dump	40 cu. yd.	31	9	Steel	62,600	July	October	Pressed Steel
Super-Power Co.	4	Ex. Side Dump	.....	90	0	.....	.....	April	.....	Clark Car
Swift Refrig. Trans. Co.	300	.....	80,000	29	5½	Steel Frame	57,100	June	August	Company Shops
Tall Timber Lumber Co.	8	Flat	80,000	40	6	St. Und'frame	.....	September	December	Am. Car & Fdy.
Taylor, H. W.	4	Air Dump	30 cu. yd.	.....		.....	.....	October	.....	Koppel
Tennessee Coal, Iron & R. R.	45	Hopper	100,000	20	11⅞	All Steel	40,200	August	December	Company Shops
Texas Company	100	Tank	8,000g.	28	0	Steel	48,300	February	May	Am. Car & Fdy.
	100	Tank	10,000g.	28	0	Steel	45,700	February	May	Am. Car & Fdy.
	2	Tank	8,400g.	33	3	Steel	50,800	August	October	Standard Steel
	300	Tank	8,000	.....		.....	.....	March	.....	Penn. Car
	100	Tank	10,000	.....		.....	.....	March	.....	Penn. Car
	200	Ins. Tank	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
Tidal Refining Co.	200	Tank	8,000	28	0	Steel	40,600	January	April	Am. Car & Fdy.
Timken Roller Bearing Co.	3	Gondola	140,000	30	0	Steel	70,166	May	August	Am. Car & Fdy.
	3	Gondola	140,000	30	0	Steel	70,000	May	.....	Canton Car
	2	Ex. Side Dump	30 cu. yd.	.....		.....	.....	December	.....	Clark Car
Union Carbide Co.	4	Hopper	100,000	30	0	Steel	38,825	March	June	Am. Car & Fdy.
	10	Tank	8 Tons	28	10½	.....	.....	March	.....	Gen. Amer. Tank
Union Oil Co. of Cal.	30	Ins. Tank	100,000	36	11	Steel Frame	59,300	March	1928	Gen. Amer. Tank
Union Pacific	6	Air Dump	20 cu. yd.	.....		.....	.....	June	.....	W. Wh. Scraper
Union Reduction Co.	2	Rack	80,000	43	0	St. Und'frame	.....	January	May	Am. Car & Fdy.
Union Refrigerator Transit	1,000	Refrigerator	80,000	39	0⅜	St. Und'frame	60,300	January	July	Am. Car & Fdy.
Union Tank Car Co.	300	Tank	80,000	37	5	Steel	46,500	April	September	Am. Car & Fdy.
	200	Tank	80,000	37	5	Steel	46,500	April	September	Gen. Amer. Tank
U. S. Cast Iron Pipe & Found. Co.	1	Ex. Side Dump	.....	.....		.....	.....	July	.....	Clark Car
Utah Railway Co.	1	Caboose	.....	34	2⅜	St. Und'frame	.....	June	September	Mt. Vernon Car
Wabash	520	S. Auto Box	80,000	40	6	St. Und'frame	46,500	February	May	Am. Car & Fdy.
	500	S. Auto Box	80,000	40	6	St. Und'frame	46,500	February	June	Standard Steel
Wagner Quarries	3	Air Dump	30 cu. yd.	34	0	Steel	73,700	September	September	Pressed Steel
Warner-Quinlan Company	15	Tank	.....	.....		.....	.....	December	.....	Am. Car & Fdy.
Western Maryland	1,000	Hopper	110,000	.....		.....	.....	April	.....	Company Shops
	2	Ex. Side Dump	.....	.....		.....	.....	July	.....	Clark Car
Western Pacific	40	Air Dump	100,000	34	0	All Steel	72,400	May	June	W. Wh. Scraper
	100	Ballast	100,000	30	2¾	All Steel	42,700	May	June	Am. Car & Fdy.
Wheeling Steel Co.	4	Air Dump	.....	.....		.....	.....	March	.....	Magor
Wichita Falls & Southern	50	Box	80,000	40	7⅝	St. Und'frame	42,400	June	September	Am. Car & Fdy.

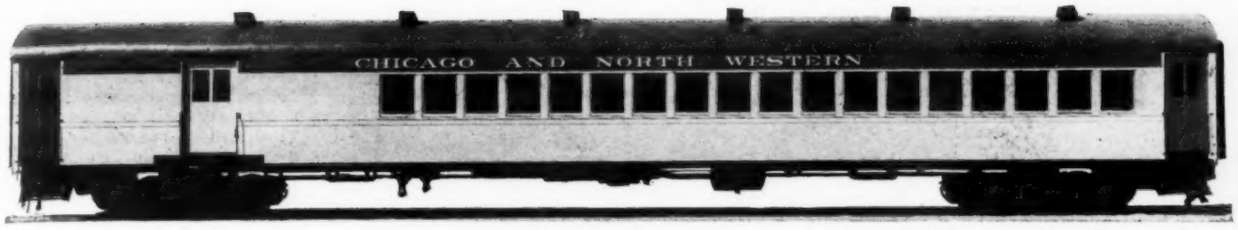
Canada

Algoma Cent. & Hud. Bay	100	Box	60 Tons	40	6	Steel Frame	46,300	November	December	Can Car & Fdy.
Aluminum Co. of Canada	2	Hopper	70 Tons	41	1½	All Steel	55,000	September	December	Can Car & Fdy.
Canadian National	200	S. S. Box	80,000	40	6	Steel Frame	46,000	January	.....	Eastern Car
	200	Refrigerator	80,000	40	9¾	St. Und'frame	58,100	January	.....	Eastern Car
	1,000	Box	120,000	40	6	Steel Frame	46,525	February	June, July	Can Car & Fdy.
	50	Caboose	.....	29	1	St. Und'frame	41,000	.....	July-Sept.	Company Shops
	500	Auto	80,000	40	6	Steel Frame	46,464	.....	July-Aug.	National Steel
	54	Dump	30 cu. yd.	34	0	Steel	68,000	February	June	National Steel
Canadian Pacific	1	D. S. Box	100,000	40	6	All Steel	47,300	January	June	Company Shops
	2	Flat	200,000	22	7	All Steel	85,000	May	December	Company Shops
Commercial Alcohols, Ltd.	1	Tank	10,000	.....		All Steel	53 000	October	December	Can Car & Fdy.
Frontenac Oil. Ref., Ltd.	10	Tank	10,000	.....		All Steel	53,000	October	December	Can Car & Fdy.
Johnson Mining Co.	2	Air Dump	21 cu. yd.	32	1⅞	All Steel	58,000	June	August	Can. Car & Fdy.
Pacific Great Eastern	10	Air Dump	20 cu. yd.	.....		.....	.....	July	.....	W. Wh. Scraper
Sidney & Louisburg	1	Dump	100,000	32	6	Steel	73,900	October	April	Eastern Car

Export

American Sugar Refining Co.	125	Cane	.....	.....		.....	.....	May	.....	Magor
Amtorg Trading Corp.	25	Dump	20 cu. yd.	.....		.....	80,000	June	.....	Pressed Steel
Anglo-Chilean Cons. Nitrate Corp.	100	Flat	.....	.....		.....	.....	August	.....	Am. Car & Fdy.
	40	Gondola	.....	.....		.....	.....	August	.....	Am. Car & Fdy.
Anglo-Mexican Petroleum Co.	3	Tank	7,400g.	26	11	All Steel	40,800	August	October	Standard Steel
Cuban-American Sugar Co.	100	Cane	30,000	.....		.....	.....	January	.....	Gregg
Guantanamo Sugar Co.	30	S. S. Box	60,000	36	6½	Steel Frame	34,600	May	August	Magor
Kirin Hailung	30	Box	80,000	.....		.....	.....	November	.....	Koppel
	20	Flat	80,000	.....		.....	.....	November	.....	Koppel
	24	H. S. Gondola	80,000	.....		.....	.....	November	.....	Koppel
	40	L. S. Gondola	80,000	.....		.....	.....	November	.....	Koppel
South African	25	Tank	9,600	41	3	All Steel	55,700	January	June	Standard Steel
	3	Well	136,000	25	0	All Steel	68,000	September	January	Standard Steel
South Manchuria	20	Air Dump	45 cu. yd.	.....		.....	.....	April	.....	Magor
South Porto Rico Sugar Co.	50	Cane	60,000	.....		.....	.....	May	.....	Magor
United Fruit Co.	1	Flat	50,000	35	0	Steel Frame	15,500	March	May	Gregg Co. Ltd.
	10	Dump	50,000	21	0	Steel Frame	38,000	March	July	Magor





Passenger and Baggage Car Built by the American Car & Foundry Company. Seating Capacity, 70; Light Weight, 99,300 lb.

Passenger Car Orders in 1927

Total for the year is behind that of one year ago— Canadian orders less

By F. W. Kraeger
Associate Editor, *Railway Age*

PASSENGER car orders for domestic use, totalled 1,612 in 1927, or about 250 cars behind orders placed in 1926 when the total was 1,868. While the total for 1927 was not the lowest on record there were only a few years in which total orders fell below this last year. In 1919, 1921, and 1908, orders were considerably below those placed in 1927. However, it is interesting to note that aside from orders placed by the Pullman Company with the Pullman Car & Manufacturing Corporation for cars for their own use, passenger car orders were about on a level with those placed

Table I—The Passenger Car Orders of 1927

For service in the United States	1,612
For service in Canada	143
For export to other countries	48
Grand total	1,803

Table II—Orders for Passenger Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162
1927	1,612	143	48	1,803

Table III—Passenger Cars Built in 1927

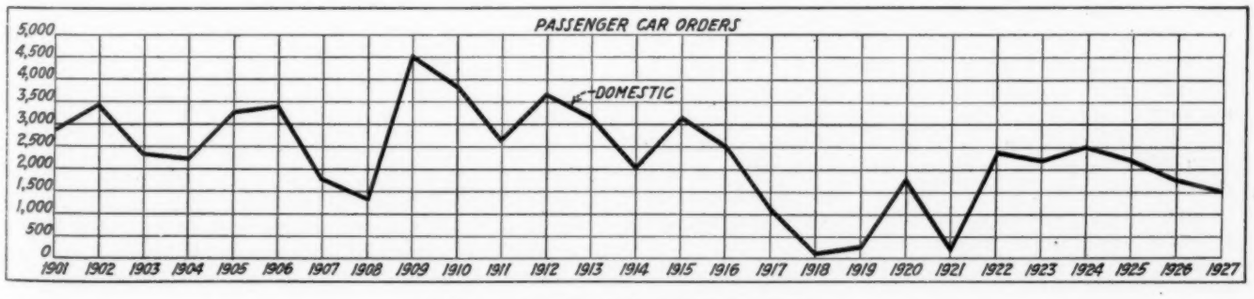
	United States	Canada	Total
Domestic	1,785	126	1,911
Foreign	50	...	50
	1,835	126	1,961

Comparison with Previous Years

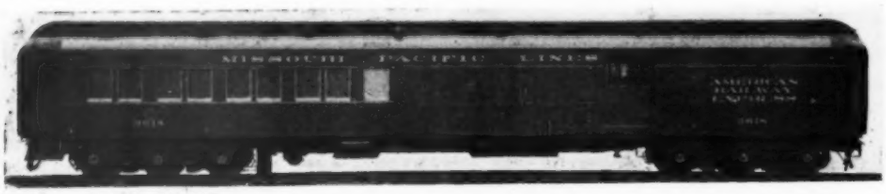
Year	Passenger: Domestic	Canadian	Export	Total
1899	1,201		104	1,305
1900	1,515		121	1,636
1901	1,949		106	2,055
1902	From 1902 to 1907			1,948
1903	passenger car figures			2,007
1904	in these two columns			2,144
1905*	included in corre-			2,551
1906*	sponding freight car			3,167
1907*	columns.			5,457
1908*	1,645	71		1,716
1909*	2,698	151		2,849
1910*	4,136	276		4,412
1911*	3,938	308		4,246
1912†	2,822	238		3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

Year	United States: Domestic	Foreign	Total	Canadian: Domestic	Foreign	Total	Grand total
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,503
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	....
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	....
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	....
1926	2,184	102	2,286	285	...	285	2,571
1927	1,785	50	1,835	126	...	126	1,961



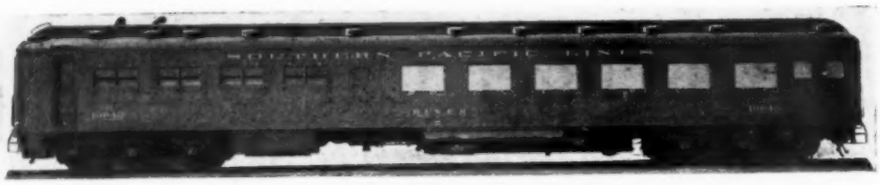
Passenger Car Orders, 1901 to 1927



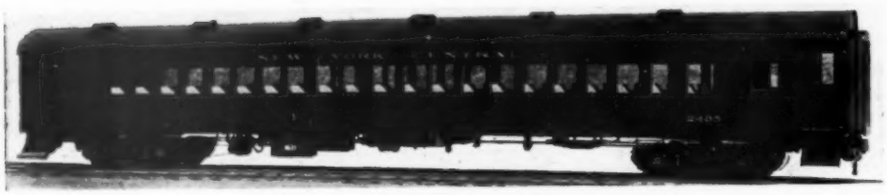
Length, 76 ft. 5 in.
Length, bagg. comb. 39 ft. 2½ in.
Seating capacity, 32
Total weight, 144,400 lb.
Built, August, 1927

Combination Express and Passenger Car Built by the St. Louis Car Company

Length, 80 ft. 5½ in.
Seating capacity, 36
Total weight, 160,500 lb.
Built, October, 1927



All-Steel Dining Car Built by the Pullman Car & Manufacturing Corporation



Length, 78 ft. 1¾ in.
Seating capacity, 96
Total weight, 105,000 lb.
Built, February, 1927

Suburban Car Built by the Osgood Bradley Car Company

Length, 80 ft. 3¾ in.
Seating capacity, 88
Total weight, 129,000 lb.
Built, January, 1927

Passenger Car Built by the Pressed Steel Car Company

Length, 66 ft. 10¾ in.
Total weight, 110,000 lb.
Built, December, 1927

Mail Storage Car Built by the Bethlehem Steel Company

in 1926. The orders placed by Pullman in 1927 were reported at 108 cars which is in contrast to 481 reported in 1926 and 425, the average yearly purchases reported by this company for the five years, 1922 to 1926 inclusive. Had Pullman orders in 1927 approached the number it ordered in 1926, total orders for passenger cars for domestic use in 1927 would have more than equalled those placed in 1926. The totals referred to do not include orders for rail-motors cars which continue to increase in popularity and which are reported in a separate article in this issue.

Railroads in Canada ordered 143 passenger cars for use in the Dominion in 1927 as contrasted to 236 ordered in 1926. Although the orders last year were higher, there was only one other higher year for passenger car orders since 1920 and that was 1923 when 263 cars were ordered. Orders of passenger cars for export amounted to 48 as compared with 58 in 1926, and 76 in 1925.

The number of passenger train cars built for use in the United States in 1927 was 1,785, less than the number built in each of the last four years, 2,184 being constructed in 1926,, 2,363 in 1925, and 2,150 in 1924. It is necessary to point out with regard to passenger cars just as it was with locomotives and freight cars that it is well to keep in mind the distinction between cars ordered and cars built when considering equipment statistics.

The explanation of why passenger car orders aside

from the Pullman Company's as reported, have kept closer to previous year's totals than have orders for other classes of equipment lies in the fact that the railroads are continuing their efforts to improve fast passenger train service and to meet the demands of expanding suburban travel out of large centers of population. The comparatively small effect of motor coach and automobile competition on passenger train car orders is noteworthy.

For the first half of 1927 it appeared as though orders for passenger cars might surpass those placed in 1926, but there was a decline in buying in the second half of the year that brought the total down to what it was. However, although the orders for cars were not equal to some of those in the last few years, 1927 did not vary greatly from the years before the war.

The largest railroad order placed in the year was that of the New York Central System for 195 cars. Next was the Long Island with 127, and the Chicago & North Western with 120, then the Chicago, Burlington & Quincy, with 118, followed by the Baltimore & Ohio with 100.

The list of orders which follow are compiled in the usual manner, returns from the railroad being checked with and amplified from lists of orders furnished by the builders, largely through the co-operation of the American Railway Car Institute, and from the weekly reports of orders in the Equipment and Supplies column of the *Railway Age*. The lists appear in the new form adopted last year. Construction is assumed to be all-steel, and exceptions are noted. Additional information presented for the first time this year includes dates of order and delivery, when possible.

Passenger Car Orders in 1927

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe	10	Baggage	75	0	..	135,000	April	.....	Pullman
	10	Postal	63	8	..	128,500	May	.....	Pullman
	20	Chair	78	8	76	152,000	May	.....	Pullman
	20	Mail & Bagg.	73	0	..	141,900	June-Aug.	.....	Pullman
	2	Coach, Bagg.	75	10	48	146,300	June	.....	Pullman
	12	Dining	83	4	36	174,200	Aug.	.....	Pullman
	3	Parlor	84	4	38	.....	July	.....	Pullman
	12	Buffet Lib.	83	10	22	.....	Aug.	.....	Pullman
	2	Official	75	4	..	.....	Aug.	.....	Pullman
	76	.....	..	..	..	.....	December	.....	Pullman
Baltimore & Ohio	50	Coaches	.				March	October	Pullman
	15	Mail Comp.	..	..	..	.....	March	August	Am. Car & Fdy.
	15	Pass. & Bagg.	..	..	..	.....	March	October	Standard Steel
	15	Baggage	..	..	..	.....	March	August	Standard Steel
	5	Dining	..	..	..	.....	January	.....	Pullman
Bangor & Aroostook	1*	Instruction	41	0	..	55,000	April	December	Company Shops
Boston & Albany	10	Coach	70	4	..	102,500	May	December	Osgood Bradley
	10	Baggage	61	3	..	111,700	May	December	Am. Car & Fdy.
	1	Business	74	0	..	172,900	May	December	Pullman
Bureau of Mines	1	Special	73	11½	..	165,000	July	December	Hotchkiss Blue
Central of New Jersey	25	Coach	72	5½	78	119,000	May	Oct. Dec.	Bethlehem
Chesapeake & Ohio	1	Business	82	4	..	186,000	Nov.	September	Pullman
	3	Mail & Expr.	70	0	..	140,000	August	December	Pullman
Chicago & Eastern Illinois		Pass. & Mail	..	..	..	.....	December	... .	Pullman
Chicago & Illinois Midland	3	Coaches	70	0	70	110,000	May	.....	Pullman
	2	Bagg. & Post.	70	0	..	110,000	May	.....	Pullman
	1	Pass. & Bagg.	70	0	22	111,000	May	.....	Pullman
Chicago & Northwestern	20	Coach	70	0	98	99,600	January	October	Am. Car & Fdy.
	20	Pass. & Bagg.	70	0	70	99,300	January	October	Am. Car & Fdy.
	40	Coach	..	..	..	.....	January	.....	Pullman
		Coach	..	..	100	.....	January	August	Standard Steel
Chicago, Burlington & Quincy	10	Coach	..	..	..	.....	January	.....	Pullman
	8	Chair	..	..	..	.....	January	.....	Pullman
	1	Bagg.-Pass.-Mail	..	..	..	.....	January	.....	Pullman
	15	Baggage	..	..	..	.....	January	.....	Am. Car & Fdy.
	5	Parl. Buff.	75	0	68	98,000	February	November	Company Shops
	36	Coach	71	11½	96	92,000	February	July	Company Shops
	33	Coach	71	11½	96	100,000	February	July	Company Shops
	1	Parl. Buff.	71	11½	38	100,000	February	July	Company Shops
	4	Pass. & Bagg.	..	..	..	.....	January	.....	Am. Car & Fdy.
	5	Lounge	..	..	..	.....	June	.....	Pullman
Chicago Great Western	2	Mail & Bagg.	..	..	..	.....	August	.....	Pullman
Chicago, Milwaukee & St. Paul	10	Baggage	72	0	..	120,000	November	.....	Amer. Car & Fdy.
Chicago, Rock Island & Pacific	10	Baggage	70	6	..	133,100	January	June	Amer. Car & Fdy.
	4	Bagg. & Mail	70	6	..	138,200	January	August	Amer. Car & Fdy.
	4	Bagg. & Smok.	70	0	38	139,600	January	October	Amer. Car & Fdy.
	40	Coach	81	8½	100	97,000	January	June	Standard Steel
	5	Dining	..	..	..	.....	January	.....	Pullman
	10	Coaches	..	..	..	.....	January	.....	Pullman
Cleveland, Cincinnati, Chicago & St. L.	2	Dining	74	4¾	36	172,700	March	June-July	Pullman
	25	Coach	70	0	85	131,500	September	November	Pullman
	1	Business	74	8	..	.....	May	January	Pullman
Delaware & Hudson	5	.....	..	..	..	.....	.....	.....	Company Shops
Delaware, Lackawanna & Western	10	Express	64	4¾	..	110,000	May	November	Am. Car & Fdy.
	20	Milk	45	5¼	..	69,500	May	October	Osgood Bradley
	3	Mail & Bagg.	74	1	..	132,000	May	.....	Pullman
Denver & Rio Grande Western	4	Dining	78	10	36	167,600	March	June	Am. Car & Fdy.
East Broad Top	2	.....	..	..	..	.....	.....	.....	Company Shops
Erie	4	Dining	80	1½	36	169,100	July	July	Pullman
	25	Coach	..	..	..	.....	July	.....	Pressed Steel
	25	Express	..	..	..	.....	July	.....	Standard Steel
Grand Trunk Western	2	Mail & Exp.	70	9	..	140,900	.....	September	Pressed Steel
Griffin, Henrietta,	1	Private	83	2¾	..	150,000	January	June	Hotchkiss Blue
Gulf Coast	2	Mail & Bagg.	73	10	..	141,600	January	June	St. Louis Car
	4	Baggage	73	10⅛	..	136,200	January	May	Am. Car & Fdy.
	6	Chair	79	0	62	147,300	January	June	Am. Car & Fdy.
Gulf, Mobile & Northern	2	Coaches	78	5¾	84	144,250	January	June	Am. Car & Fdy.
	1	Business	..	..	..	.....	July	.....	Am. Car & Fdy.
Illinois Central	10	Bagg. & Exp.	70	9	..	135,300	June	February	St. Louis Car
	6	Bagg. & Mail	70	9	..	143,600	June	December	Am. Car & Fdy.
International-Great Northern	2	Baggage	73	10⅛	..	136,200	January	April-May	Am. Car & Fdy.
	4	Chair	79	0	62	147,300	January	April-May	Am. Car & Fdy.
	6	Coach	78	11⅜	84	144,200	January	April-May	Pullman
	2	Dining	82	3¾	36	158,100	January	April-May	Pullman
Jones, H. F., Jr.	1	Business	74	8	..	187,000	.....	.....	Pullman
Lehigh Valley	4	Dining	81	10½	30	159,000	August	January	Pullman
	2	Club-Dining	81	10½	34	159,000	August	March	Pullman
Long Island	117	Coach	64	5¾	76	80,700	April	October	Am. Car & Fdy.
	10	Comb. Coach	64	5¾	54	78,500	April	October	Am. Car & Fdy.

* Steel underframe.

Purchaser	No.	Class	Length Ft.	Length in.	Seating capacity	Weight	Date of order	Date of delivery	Builder
Louisville & Nashville	2	Baggage	72	9¾	..	136,500	December	.....	Am. Car & Fdy.
	4	Pass. & Bagg.	74	4¾	36	141,500	December	.....	Am. Car & Fdy.
	4	Pass. & Bagg.	66	1¾	48	115,350	December	.....	Am. Car & Fdy.
	4	Coach	77	9¾	80	145,100	December	.....	Am. Car & Fdy.
	4	Coach	77	9¾	82	144,000	December	.....	Am. Car & Fdy.
Louisville, Hend. & St. L.	2	Coach	78	5¾	82	144,500	March	September	Am. Car & Fdy.
Maine Central	2	Mail & Bagg.	60	0	..	120,000	October	.....	Osgood-Bradley
Maryland & Pennsylvania	.	.....	..	..	..	.....	.....	.....	Company Shops
Michigan Central	3	Dining	83	½	36	173,000	December	July	Pullman
	25	Coach	78	7¾	85	131,400	May	October	Pullman
	2	Bagg. & Mail	64	1¾	..	118,000	May	December	Standard Steel
	10	Bagg. Horse	73	10¾	..	140,000	May	January	Am. Car & Fdy.
	1	Business	83	½	..	180,000	May	January	Pullman
Missouri Pacific		Mail & Bagg.	63	10	..	141,600	February	Sept., Oct.	St. Louis Car
	10	Coach & Bagg.	76	1	32	144,400	February	August	St. Louis Car
	10	Baggage	70	0	..	135,700	January	June	Am. Car & Fdy.
	3	Cafe-Club	78	11⅜	60	148,700	January	July	Pullman
	5	Dining	82	3¾	36	158,100	January	August	Pullman
	10	Coach	78	11⅜	84	144,200	January	June	Pullman
Mobile & Ohio		Coach	..	..	..	.....	January	.....	Pullman
	6	Baggage	..	..	..	.....	January	.....	Am. Car & Fdy.
	1	Pass.-Bagg.-Mail	..	..	..	.....	January	.....	Am. Car & Fdy.
	6	Coach	..	..	..	.....	October	.....	Bethlehem Steel
New Orleans, Texas & Mexico	2	Mail & Bagg.	73	10	..	141,600	February	October	St. Louis Car
New York Central	20	Dining	81	3¾	36	173,500	December	August	Pullman
	10	Coach	77	9¾	85	131,000	May	December	Pullman
	15	Coach	77	9¾	85	131,000	May	December	Standard Steel
	20	Coach	77	9¾	85	131,000	May	January	Pressed Steel
	3	Pass. & Bagg.	74	11¾	48	137,000	May	January	Pressed Steel
	29	Baggage	63	3¾	..	111,000	May	December	Am. Car & Fdy.
	10	M. U. Coach	69	4½	100	127,700	May	January	Standard Steel
	1	M. U. Bagg.	62	6½	..	127,000	May	February	Standard Steel
	1	Business	..	...	..	.....	.....	.....	Pullman
N. Y., N. H., & Hartford	20	Baggage	70	⅛	..	121,000	May	November	Osgood Bradley
	25	Milk	35	0	..	48,000	August	.....	Company Shops
New York Westchester & Boston	25	M. U. Coach	..	..	..	.....	December	.....	Osgood-Bradley
Norfolk & Western	3	Dining	78	1	30	157,714	March	August	Pullman
	25	Mail. Storage	66	10¾	..	110,000	June	December	Bethlehem Steel
Pennsylvania	16	M. U. Coach	48	...	52	79,250	January	October	Am. Car & Fdy.
Pittsburgh & Lake Erie	5	Coach	70	0	84	130,000	April	January	Pressed Steel
Pullman Company	8	Club	..	..	..	.....	.....	.....	Pullman
	50	Parlor-Obs.	..	..	..	.....	.....	.....	Pullman
	50	Sleeping	..	..	..	.....	.....	.....	Pullman
Reading		Baggage	63	0	..	108,180	June	November	Am. Car & Fdy.
	5	Bagg. & Mail	63	0	..	115,000	August	February	Am. Car & Fdy.
	5	Bagg. & Mail	63	0	..	115,000	August	February	Bethlehem Steel
	5	Baggage	63	0	..	108,180	June	December	Bethlehem Steel
	2	Horse	74	0	..	145,000	July	May	Company Shops
Richmond, Fredericksburg & Potomac		Dining	80	1½	36	171,300	February	August	Pullman
Southern	1	Business	..	...	..	.....	.....	September	Pullman
	2	Business-Din.	..	...	..	.....	.....	September	Pullman
	23	Bagg. & Post.	..	..	..	.....	December	.....	Bethlehem
	2	Baggage	..	..	..	.....	December	.....	Bethlehem
Southern Pacific		Baggage	72	11¼	..	124,200	March	August	Bethlehem Steel
	5	Bagg. Horse	72	11⅛	..	134,600	March	October	Bethlehem Steel
	5	Bagg. & Post	72	11⅛	..	131,960	March	October	Bethlehem Steel
	10	Coaches	80	5½	86	140,800	March	Oct.-Nov.	Standard Steel
	5	Coaches	80	5½	90	140,800	March	Oct.-Nov.	Standard Steel
	5	Coaches	80	8⅞	96	120,000	March	December	Standard Steel
	6	Dining	80	5½	36	160,500	March	Oct.-Nov.	Pullman
	6	Bagg. & Post	62	11⅛	..	132,000	September	February	Pullman
	1	Official	83	2¼	..	182,000	May	January	Pullman
	1	Official	83	2¼	..	182,000	April	January	Pullman
Southern Pacific; Tex. & N. O.	20	Baggage	73	0	..	125,600	March	October	Bethlehem Steel
	15	Coach	80	6	90	141,000	March	November	Standard Steel
State of N. Y. Conservat. Dept.	1	Fish Dist.	73	4¾	..	134,000	March	October	Am. Car & Fdy.
Tennessee Central	1	Baggage	66	6	..	100,300	November	November	Hotchkiss Blue
Wabash	6	Pass. & Bagg.	78	6⅞	26	143,500	April	October	Am. Car & Fdy.
	6	Pass. & Bagg.	78	6⅞	26	143,500	April	November	St. Louis Car
	10	Coach	81	1	84	148,000	April	September	Am. Car & Fdy.
	4	Chair	81	1	68	148,400	April	October	Am. Car & Fdy.
	6	Chair-Smok.	81	1	67	148,600	April	October	Am. Car & Fdy.
	4	Chair-Lounge	83	0	57	162,000	April	November	Pullman
	2	Chair-Cafe	75	9	50	157,000	April	November	Pullman
	6	Dining	81	5¾	36	165,500	April	November	Pullman

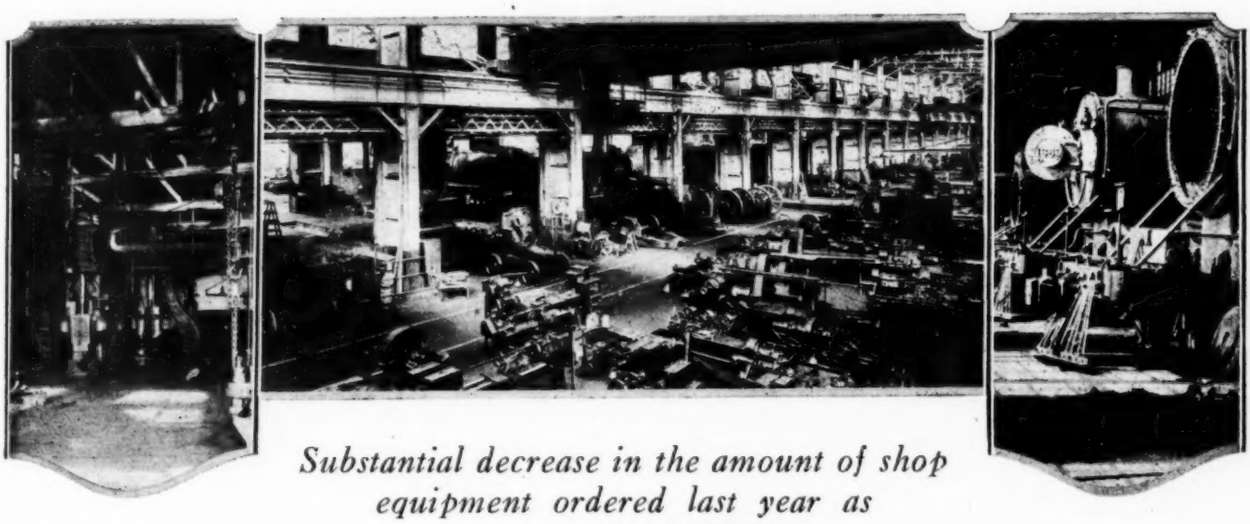
Canada

Canadian National	20	Coach	71	6	80	153,400	February	August	National Steel
	12	Baggage	73	6	..	139,200	February	July	National Steel
	-	Bagg. & Smoker	73	6	39	147,900	February	August	National Steel
	2	Exp.-Refrig.	50	0	..	85,900	September	October	National Steel
	12	Diner	84	10½	30	175,500	February	June	Can. Car & Fdy.
	5	Comp.	84	7½	35	175,000	February	June	Can. Car & Fdy.
	50	Obs.-Sleeper	84	4½	50	171,100	February	May	Can. Car & Fdy.
	2	Parlor	84	4½	39	163,600	April	July	Can. Car & Fdy.
	1	Official	84	6	..	.....	May	December	Can. Car & Fdy.
		Official	84	9	..	.....	May	December	Can. Car & Fdy.
Canadian Pacific	5	Comp. Sleeper	83	10½	40	180,000	February	June	Company Shops
		Obs Sleep.	83	10½	48	182,000	February	July	Company Shops
	20	Baggage	48	3¾	..	79,000	October	January	National Steel
	1	Official	83	10½	..	189,700	February	May	Company Shops
	1	Official	83	10½	..	190,300	February	May	Company Shops
		Official	83	10½	..	199,100	June	October	Company Shops
Toronto, Hamilton & Buffalo	1	Business	83	10½	..	195,320	June	November	Canadian Pacic

Export

Ferrocarril Del Pacifico	15	Pass.	..	...	..	.....	October	.....	Am. Car & Fdy.
	10	Pass.	..	...	..	.....	October	.....	Am. Car & Fdy.
Paulista Railway of Brazil	3	Parlor	..	...	..	.....	May	.....	Am. Car & Fdy.
	-	Chair	..	...	..	.....	May	.....	Am. Car & Fdy.
	2	Mail	..	...	..	.....	May	.....	Am. Car & Fdy.
	-	Coach	..	...	..	.....	May	.....	Am. Car & Fdy.
	6	Coach	..	...	..	.....	May	.....	Am. Car & Fdy.
South Australian	2	Sleeping	73	0	..	166,500	.....	.....	Pullman
	1	Diner	79	2	48	167,000	.....	.....	Pullman

Machine Tools Ordered During 1927



Substantial decrease in the amount of shop equipment ordered last year as compared with 1926

By L. R. Gurley
Associate Editor, *Railway Age*

DURING 1927, the orders placed for machine tools and shop equipment by 99 railroads representing 88 per cent of the route mileage of the continent, totaled 2,172 units. The orders placed in 1926 by 97 railroads in the United States and Canada which represented 84 per cent of the total route mileage totaled 3,457 units, and for 1925 by 88 railroads representing 77 per cent of the total route mileage 2,594 units. The first tabulation, which was published in the 1925 Annual Statistical Number of the *Railway Age*, which listed

Heavy Machines Are Required for the Boiler Shop

the orders placed during 1924, totaled 1,658 units of equipment ordered by 85 railroads, representing 77 per cent of the total route mileage. The low figure for 1924 can be accounted for by the fact that the lists did not include blacksmith, boiler and car metal working machines; car shop woodworking machines; material handling equipment, such as shop trucks, overhead cranes, car and locomotive hoists, and small shop hoists, furnaces, motors, air compressors, and welding equipment, which have been included in the lists since 1925.

The number of units of equipment ordered during 1927 is considerably less than the number ordered during the past two years. Several reasons may be advanced for the falling off of machine tool orders placed during the past year. During recent years many of the larger railroads laid out definite programs of replacing obsolete machine tools and shop equipment with modern units. The bulk of these replacement units were ordered during 1925 and 1926 with the result that the greater part of the replacement program was completed during this period, thus reducing the number of orders placed during 1927. Many new repair shops were built and provided with new equipment during 1925 and 1926. No new shops of large size were equipped during 1927.

The so-called Florida boom and general industrial expansion of the south was at its height during 1925 and 1926. In order to meet the abnormal traffic demands, the southern roads had to buy many new locomotives and cars. To provide for the maintenance of the increased amount of equipment, these roads had to place orders for a large amount of new machine tools and shop equipment to supplement the existing equipment and also to replace obsolete tools with modern units. A number of new repair shops were built and equipped by the southern roads. These factors were responsible for the large orders of equipment placed by the southern roads during 1925 and 1926. These roads are now in a position to maintain their equipment adequately.

Twenty-five of the 97 railroads in the 1926 list do not appear in the 1927 list as they reported no orders during the year. However, these roads have been replaced by 27 railroads which ordered new equipment in 1927, but not in 1926, or an increase of two over the number of roads in the 1926 list.

The data available for four years indicates some interesting trends in the types of machine tools purchased by the railroads. The tables show that lathes are by far

Purchaser	Lathes				Drill Presses		Planers	Shapers	Slotters	Boring Mills		Milling Machines		Grinding Machines				Metal Cutting Saws	Portable Boring, Facing and Turning Machines	Bolt Cutters and Threaders	Pipe Cutters and Threaders	Presses		Hammers		Forging Machines		Bulldozers	Punches	Shears	Combination Punch and Shear
	Axle	Engine	Turret	Wheel	Radial	Vertical and others				Horizontal	Vertical and others	Universal	Horizontal and others	Cylindrical	Internal	Surface	Double End Tool and others					Wheel	Others	Steam	Other Power	Others					
Akron, Canton & Youngstown																														
Algoma Eastern		1																			1									
Ann Arbor																														
Atchison, Topeka & Santa Fe	2	13	1	3	2	1	5	1	1	1			2	1	1	1	8			3	3	1		3	1	2			6	3
Atlanta & West Point																	1													
Atlantic Coast Line																														
Baltimore & Ohio	1	12			2	9	2	4			1	2	2	1	3	3	8	6	5	2	5		2			3	1		1	
Bangor & Aroostook									1																					
Belt Railway Company of Chicago		1						1																						
Boston & Albany		2			1	1											1		1		1		1							
Bessemer & Lake Erie																		2												
Boston & Maine		1	1		2						1		1				9	1			1									
Buffalo, Rochester & Pittsburgh		5	2		2			2			2						5				1	1								
Canadian Pacific	1	3	4		1		1	3			3	1	1		1		5			1	1	1		1	1					
Central of Georgia					2	1		1			1				1		1						2	1					1	
Central of New Jersey																	2		1											
Chesapeake & Ohio																					1									
Chicago, Burlington & Quincy				1											1		3	2											1	1
Chicago & Eastern Illinois	1			1							2											1	4							
Chicago Great Western						2													1				4							
Chicago, Indianapolis & Louisville		1													1		2													
Chicago & North Western	1					3		1									4	1				1	1						1	
Chicago, Milwaukee & St. Paul		4			3	7		3			4						22			1	1	1	1					1	1	
Chicago River & Indiana		1			1														1	1				1						
Chicago, Rock Island & Pacific		7	1		1	1		2			2			1	2	1	20	3		3										1
Chicago Short Line																		1												
Chicago, St. Paul, Minneapolis & Omaha		3	1			4	1				1	1					1							1						
Cincinnati, New Orleans & Texas Pac.		1																												
Cincinnati Northern							1																							
Clev., Cin., Chicago & St. Louis	2	2			1	2					1		1				2			2										
Delaware & Hudson											2		1							1	1			2						
Delaware, Lackawanna & Western	1	2		1	2	4	1	1			2		1	1	3		1			1	2	1		1				1	1	
Detroit & Toledo Shore Line																						1								
Duluth & Iron Range																				1										
Duluth, Missabe & Northern	1	3			1		1		1		1																			
Elgin, Joliet & Eastern			1			2									1															
Erie	1		1	2	1	1					1						2	1		2			1		1					
Ft. Worth & Denver City		1															2													
Georgia											1																			
Georgia & Florida																														
Great Northern				1		2													1			1								
Gulf, Mobile & Northern		1																				1								
Gulf Coast Lines		1	1			2					1						5													
Hocking Valley		1	1		1															2										
Illinois Central	1					1											3												1	
International-Great Northern		2	1		1	1					1		1				14	1		1		2	1		1	1				1
Kansas City Southern	1	2									1											1								
Lake Superior & Ishpeming											1																			
Lehigh Valley			2		2										1									1						1
Long Island					1	2																								
Los Angeles & Salt Lake	1	1			1		1	2									1		2											
Louisiana & Arkansas								1													1								1	
Louisville, Henderson & St. Louis																			1											
Louisville & Nashville	1	7				1		1			1						12			1	1	1	1			1				
Maine Central															1												1			
Michigan Central		1	3			4		1			2	1					20	1		3	3	2			1			1	1	1
Minn., St. Paul & Sault Ste Marie																	1													
Missouri and North Arkansas		1				1		1																						
Missouri-Kansas-Texas		2			1	2		1			2	1			2		6						3						1	
Missouri Pacific	1	6	3	2	1	5		8	2		1		2	1		1	5			1	1								2	3
Monongahela		1															2		2											
Muscle Shoals, Birmingham & Pen.																			1											
Nashville, Chattanooga & St. Louis		2											1	1			2				2									
New Orleans Great Northern																														
New York Central	4	14	2		4	9	1		1	1	3		1		1	1	20	4	2		1		6	2	1	1	1		1	1
New York, Chicago & St. Louis																														
New York, New Haven & Hartford	1				1									1	1		2		1				2							
New York, Ontario & Western																														
New York, Westchester & Boston																														1
Norfolk Southern																														
Norfolk & Western	1	12	2	2	5	5	4	3	1	1		1	2	1			9	3	1	1	6		2		3		2			1
Northern Pacific		4			5	1						1			2		4	1		1	2	1	1		3					1
Ohio Central	1																													
Oregon Short Line		2						1			1		1	1		1							1							
Oregon-Wash. R.R. & Navigation Co.		1	1			3					2						2				1									
Pacific Electric Railway		1															1													
Pennsylvania		2				5											2	4		1			1						1	
Pere Marquette		1	1					1					1	1	2		5				2								2	
Pittsburgh & Lake Erie			2								1		1										1							
Pittsburgh & Shawmut																					1									
Portland Terminal																	1													
Pittsburgh & West Virginia			1					1																						
Reading		5				4	3								1	1	7		1	1	1									3
Richmond, Fredericksburg & Potomac			1	1					1						1		1													
St. Louis-San Francisco	1							1							1	1				1	2									
St. Louis Southwestern	1										1				1		1													
Southern Pacific		5			1	1	1	4			2				1						1	2	1					1	1	
Southern Railway		5			1	1	1	1			4						3		2	1			1	1						1
Spokane, Portland & Seattle		1																						1						
Tennessee Central		1																												
Terminal R.R. Assoc. of St. Louis		1								1							2		1										1	
Texas & Pacific		1				1											3					1	1							
Toledo, Peoria & Western																			1											
Toronto, Hamilton & Buffalo					1																			1						
Union Pacific	1														2		6								1		1			
Virginian															1															
Wabash	1	2				3											3		3		2		1							
Western Pacific															1								1		1					
Wheeling & Lake Erie																														
TOTAL	27	149	33	14	48	92	23	46	8	4	49	8	19	10	32	10	236	31	29	30	45	17	42	12	18	9	5	4	23	20

Purchaser	Flue Shop Machinery		Boiler Shop Machinery				Furnaces		Wood Working Machinery						Overhead Cranes	Car and Loco. Hoists and Drop Tables	Hoists			Trucks			Air Brake Test Racks	Air Compressors	Motors	Electric Welders
	Flue Welders	Misc.	Flangers	Forming Rolls	Riveters	Blowers	Oil	Electric and Others	Boring Machines	Mortisers	Surfacers and Jointers	Tenoners	Wood Cutting Saws	Others			Air	Electric	Chain	Electric	Gas	Trailers				
Akron, Canton & Youngstown													1		1										1	
Algoma Eastern																										
Ann Arbor																							1			
Atchison, Topeka & Santa Fe				2		2	2	1		1			3	5		26			10	2			2			
Atlanta & West Point													1				1			1				1		
Atlantic Coast Line															1									1		2
Baltimore & Ohio	1	1	1										1	1	2	2	3	17	32					7		
Bangor & Aroostook											1													1	2	
Belt Railway Company of Chicago																								1		
Boston & Albany		3					3										3									
Bessemer & Lake Erie																1										
Boston & Maine		2																1			1			1		4
Buffalo, Rochester & Pittsburgh																				2						
Canadian Pacific	1																				1					2
Central of Georgia						1																		2		2
Central of New Jersey							4								1	2	5		1		3	11		2	3	
Chesapeake & Ohio	2	2					3												22	3						
Chicago, Burlington & Quincy	1			1	1		1						4					4							1	
Chicago & Eastern Illinois																				1			1			
Chicago Great Western																										
Chicago, Indianapolis & Louisville															2											
Chicago & North Western										1			3						1					3		
Chicago, Milwaukee & St. Paul					1			1				1		1						5						4
Chicago River & Indiana						2																				
Chicago, Rock Island & Pacific				1			1				1		4				8	2		3		1				
Chicago Short Line			1																							
Chicago St. Paul, Minneapolis & Omaha						1	1	1	2								1			1						
Cincinnati New Orleans & Texas Pac.																									1	
Cincinnati Northern																										
Clev. Cin., Chicago & St. Louis							8								2					1	1			3	2	
Delaware & Hudson												1			2						2			2		1
Delaware, Lackawanna & Western								1	1	1	1						2	1		1						2
Detroit & Toledo Shore Line																				1						1
Duluth & Iron Range																										
Duluth, Missabe & Northern	1		1																							
Elgin, Joliet & Eastern		1			1			2							1											
Erie						19	7			2	1	2	2	1						2	1	6	1	3	1	
Ft. Worth & Denver City																							2			
Georgia														1			2			1						
Georgia & Florida																										1
Great Northern								3					1													
Gulf, Mobile & Northern									1																	
Gulf Coast Lines											1		3			4								1		
Hocking Valley					1					1										1						
Illinois Central								4							1		1	6	5	4	4					
International-Great Northern		2					3		2	2	2	1	3		1											
Kansas City Southern																										
Lake Superior & Ishpeming																										
Lehigh Valley																	2			3						
Long Island													1	1			5			2			3	3	2	1
Los Angeles & Salt Lake																1							1		3	
Louisiana & Arkansas																										
Louisville, Henderson & St. Louis																										
Louisville & Nashville										1	1		3			1									13	2
Maine Central	1																									
Michigan Central						1	3				1		6								3			1		
Minn., St. Paul & Sault Ste Marie		1														1								2		
Missouri and North Arkansas																								1	3	
Missouri-Kansas-Texas								2					1				6		3				1			
Missouri Pacific		1	1			5	1								4			2					1	1	30	1
Monongahela																										
Muscle Shoals, Birmingham & Pen.																								1	9	
Nashville, Chattanooga & St. Louis				2					1				1					3				3				
New Orleans Great Northern																							1	1		
New York Central							7						1	1			4	3		1			2		14	1
New York, Chicago & St. Louis													2													
New York, New Haven & Hartford		1											3		2			2	1	13	4	3		5		
New York, Ontario & Western													2													
New York, Westchester & Boston																		5								
Norfolk Southern																										
Norfolk & Western				1		3	1	1			1				5	4		9			4	18		5		2
Northern Pacific				1						1						4										5
Ohio Central																										
Oregon Short Line								1																1		
Oregon-Wash. R.R. & Navigation Co.								3						2												
Pacific Electric Railway																	1									
Pennsylvania							1	2							2	11	6	1	8	4	3	34	18	3		2
Pere Marquette	1	3					3			1	1		1	6		1					1		1	2		3
Pittsburgh & Lake Erie															2		1									
Pittsburgh & Shawmut							1																			
Portland Terminal																										
Pittsburgh & West Virginia															1											
Reading	1	2									1		5	3		2			1		5	56	1		1	2
Richmond, Fredericksburg & Potomac																								2		1
St. Louis-San Francisco	1			1											2										32	
St. Louis Southwestern																									1	
Southern Pacific					1	2					2		1	1										1		
Southern Railway	1												2			3								2		2
Spokane, Portland & Seattle																								1		
Tennessee Central							1																			
Terminal R.R. Assoc. of St. Louis									1		1						2								1	1
Texas & Pacific						1	1																1			
Toledo, Peoria & Western																										
Toronto, Hamilton & Buffalo																			1							
Union Pacific								3					1							3				3		1
Virginian								2						1										1		1
Wabash		2					1		4														6		2	1
Western Pacific													1													1
Wheeling & Lake Erie	1	3																								
TOTAL	12	24	4	9	5	37	53	27	12	11	15	5	57	24	32	63	53	56	85	55	33	132	43	64	122	46

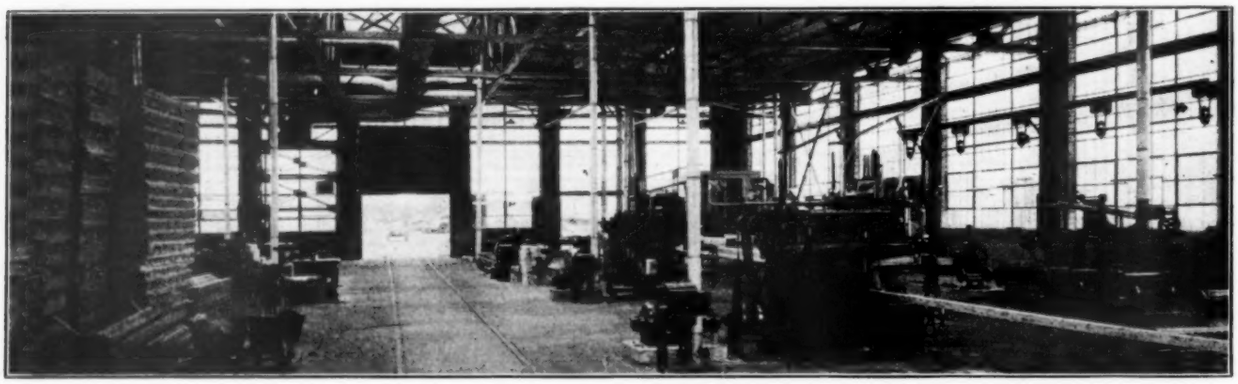
the most widely used in railroad shops. The total number of axle, engine, turret and wheel lathes ordered during 1924 to 1927, inclusive, were 363, 310, 395 and 223, respectively, of which approximately 60 per cent were engine lathes. During the same period the orders placed for drilling machines numbered 124, 179, 296 and 140, respectively. The total numbers of planers, shapers and slotters, standard equipment in any railroad shop, ordered during 1924 to 1927, inclusive, were 127, 104, 121 and 77, respectively. The orders for boring mills have decreased 50 per cent below the orders for 1926. That grinding machines have been purchased in large numbers may be attested by the fact that during the four-year period beginning with 1924, the total orders for each year are 240, 291, 408 and 308, respectively. The column headed "Other grinding machines," includes such small machines as double end, twist drill, tool, universal and chaser grinders, as well as such types as saw blade, valve, knife cock, bench and electric car wheel grinders. The orders placed for internal grinders increased 50 per cent.

Bolt and pipe cutters and threaders have been ordered at the rate of 96, 93, 120, 75 for each year beginning with 1924 up to and including 1927. The orders for metal cutting saws decreased 50 per cent below the figure for 1926. The total number of orders for presses, hammers, forging machines, punches, shears and combination punch and shears placed during the years 1924 to 1927, were 208, 217, 325 and 149, respectively.

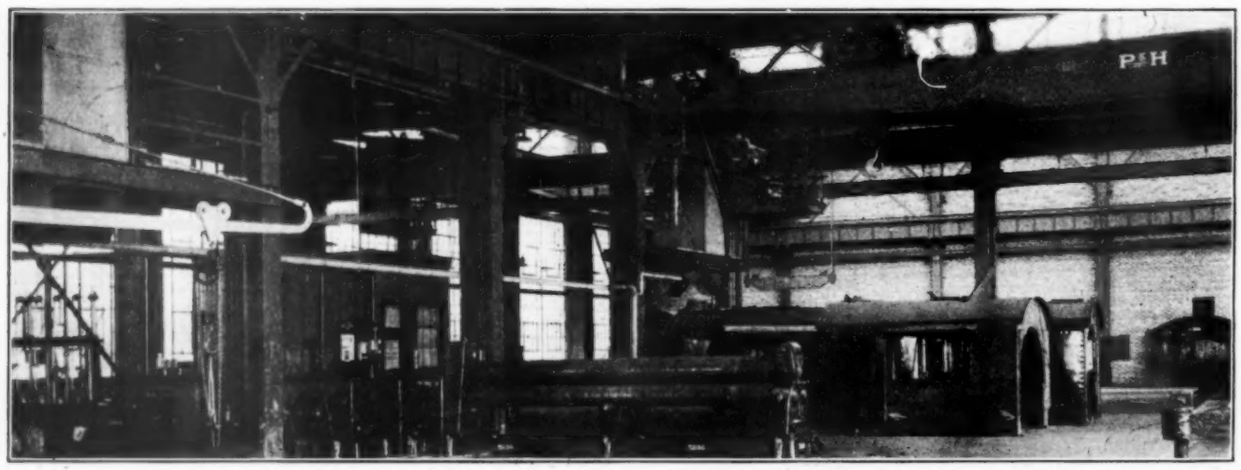
The railroads are continuing to purchase woodworking machinery in spite of the general use of steel passenger and freight cars. During the past four years, beginning with 1924, the roads ordered 146, 160, 216 and 124 units of this class of machinery, which includes borers, mortisers, surfacers, tenoners and saws.

Material Handling Equipment

The purchase of material handling equipment, such as cranes, hoists, and trucks, has shown little change during the past three years. It is significant that orders for this class of equipment have held up during 1927 in the face of a general decline. The total number of air, electric and chain hoists ordered during 1925, 1926 and 1927 were 230, 211 and 193, respectively, and overhead cranes and car and locomotive hoists and drop tables were ordered to the extent of 37 during 1925, 74 during 1926 and 95 during 1927. The total number of electric and gasoline trucks, together with trailers, which were ordered during the past three years starting with 1925, total to 216, 309 and 200 of these units, respectively.



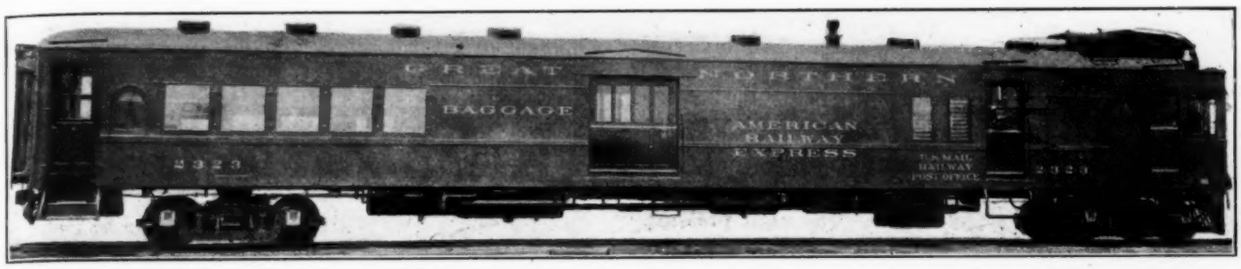
A Considerable Number of Orders for Woodworking Machinery Are Placed Each Year



Overhead Cranes and Hoists for Handling Materials Are Essential in Modern Railroad Repair Shops

The orders for riveters and blowers for the past year decreased 60 per cent, while on the other hand, the orders for furnaces remained practically the same as the number ordered during 1926. The column headed "other furnaces" includes plate and electric rivet furnaces, as well as such equipment as tempering, brass, gas, hammer and forging furnaces.

The railroads ordered 43 air brake test racks during 1927. Sixty-four air compressors of various types were also ordered for shop use.



A Great Northern Car 74 ft. 3 in. Long, over the Couplers—Built by St. Louis Car Company and Equipped with Electro-Motive Company Power Plant

Rail Motor Car Orders

Number of cars ordered in 1927 shows material increase over preceding year

By C. B. Peck
Mechanical Department Editor, *Railway Age*

DURING 1927 orders were placed in the United States and Canada for a total of 201 internal combustion engine propelled motor cars and trailers. Of these, 180 were for service in the United States, of which 157 are motor cars and 24 are trailers. This is the largest number of either motor cars or trailers which has been reported in any year since 1922, when orders for this class of equipment were first reported in the *Railway Age*. In the table showing the comparison of the orders for the past six years, attention should be called to the corrected figures given for 1926. Owing to a duplication, which occurred in tabulating the orders placed in 1926 by the Lehigh Valley, the totals for 1926 as previously reported were too large by nine motor cars and seven trailers.

Orders for Rail Motor Cars and Trailers

	1922	1923	1924	1925	1926	1927
For service in the United States	51	77	120	149	142	180
For servive in Canada	7	3	12	7	4	9
For export	1	22	..	34	32	12
Total	59	102	132	190	178	181
Motor cars	50	93	112	171	161	176
Trailers	9	9	20	19	17	25

Last year attention was called to the constant trend toward heavier and more powerful cars which has been evident throughout the history of this class of equipment. Owing to the number of cars in which neither the horsepower of the motor nor the weight of the car has been given, the comparison of car weights and power plant capacity shown in the tables must be based on considerably less than the total number of cars ordered in 1927. It will be evident, however, from a glance at the tables that the same tendency is still shown in a marked degree and that a considerable proportion of the motor cars ordered during 1927 weighed over 100,000 lb. and have power plants in the 250 to 300 hp. group. An increase is also shown in the number of cars having power plants of over 300 hp., most of which are of the double power plant type, developing from 400 to 550 hp.

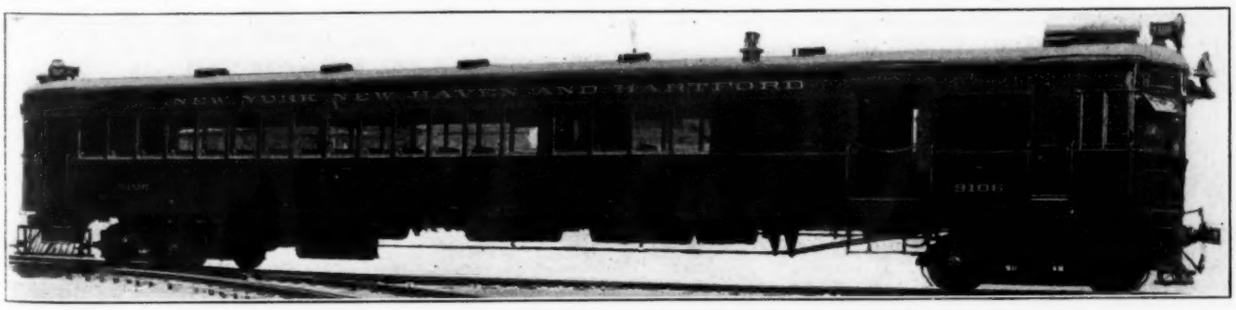
Power Plant Capacity of Rail Motor Cars, U. S. and Canada

Horsepower	1925	1926	1927
100 or less	13	14	2
Over 100 to and including 125	5	7	..
Over 125 to and including 150	9	..	..
Over 150 to and including 175	20	1	..
Over 175 to and including 200	49	3	3
Over 200 to and including 250	36	65	43
Over 250 to and including 300	2	26	76
Over 300	2	10	16
Unclassified	..	..	24

Comparison of Rail Motor Car Weights, U. S. and Canada

Weights	1925	1926	1927
25,000 lb. and under	6	7	..
Over 25,000 lb. to and including 50,000 lb.	19	7	2
Over 50,000 lb. to and including 75,000 lb.	74	2	4
Over 75,000 lb. to and including 100,000 lb.	27	79	29
Over 100,000 lb.	9	29	103
Unclassified	..	..	26

This tendency away from the smaller and lighter cars



One of Six 73-ft. 250-hp. Gas-Electric Cars Built for the New York, New Haven & Hartford by the J. G. Brill Company

was accompanied by a material decrease in the number of cars with the gear shift type of transmission. In the orders reported for 1926 for the railroads in the United States and Canada there were 24 cars of this type reported, whereas this year all but six of the cars reported are equipped with electric transmission.

A review of developments in the motor car field would not be complete without mention of the high pressure steam driven motor car brought out this year after development in the laboratories of the International Harvester Company. The use of high steam pressures (in this car they vary from 550 to 600 lb. in the working range) in motors especially designed for the use of such pressures at relatively high speeds, opens up a new field for the use of steam which is likely to lead to a number of interesting developments in the next few years.

A list of the orders for rail motor cars and trailers placed during 1927 follows.

Orders for Gasoline, Gas-Electric or Storage Battery Rail Motor Cars

For Service in the United States

Purchaser	No.	Motor or trailer	Type of power plant	Horsepower	Seating capacity	Length of bagg. compt. Ft. In.	Weight	Builder
Alaska	**1**	**Motor**	**Gas-Electric**	**250**	**26**	**25 0**	**92,100**	**J. G. Brill Co.**
	1	Trailer	.....	...	60	.....	54,000	J. G. Brill Co.
Atchison, Topeka & Santa Fe	1	Motor	Gas-Electric	275	76	11 2	110,000	J. G. Brill Co.
	2	Motor	Gas-Electric	275	77	8 3	108,000	Electro-Motive
Baltimore & Ohio	17	Motor	Gas-Electric	250	71	.....	90,000	J. G. Brill Co.
	1	Trailer	.....	...	..	.....	.....	J. G. Brill Co.
Boston & Maine	1	Motor	Gas-Electric	**190**	**50**	**11 3**	**65,000**	J. G. Brill Co.
Central Vermont	2	Motor	Gas Electric	250	51	14 11	**92,400**	**J. G. Brill Co.**
	1	Trailer	.....	...	..	50 10	**57,800**	J. G. Brill Co.
Chicago & Alton	2	Motor	Gas Electric	[illegible]	12	31 3	104,000	Electro-Motive
	2	Motor	Gas-Electric	275	24	25 5	104,000	Electro-Motive
Chicago & North Western	3	Motor	Gas-Electric	250	40	16 8	.....	Electro-Motive
	1	Motor	Gas-Electric	275	40	16 8	.....	Electro-Motive
	5	Motor	Gas-Electric	550	..	34 0	.....	Electro-Motive
Chicago, Burlington & Quincy	2	Motor	Gas-Electric	275	12	27 0	**106,000**	**Electro-Motive**
	2	Motor	Gas-Electric	275	..	**40 0**	106,000	Electro-Motive
	4	Motor	Gas-Electric	275	28	28 0	108,000	Electro-Motive
	3	Motor	Gas-Electric	275	57	**26 0**	108,000	Electro-Motive
	5	Motor	Gas-Electric	275	40	25 0	109,000	Pullman
	9	Motor	Gas-Electric	275	25-32	25-29	112,000	Pullman
	3	Motor	Gas-Electric	275	..	40 0	104,000	Pullman
	7	**Motor**	Gas-Electric	275	53-77	24 0	113,000	Pullman
Chicago, Milwaukee & St. Paul	10	Motor	Gas-Electric	...	..	.....	.....	Standard Steel
	5	Motor	Gas-Electric	275	44	12 0	111,000	Pullman
Chi., St. Paul, Minn. & Omaha	1	Motor	Gas-Electric	275	57	16 0	.....	Electro-Motive
	1	Motor	Gas-Electric	275	80	8 9	.....	Electro-Motive
Chicago, Springfield & St. Louis	1	Motor	Gas	190	50	11 3	54,900	J. G. Brill Co.
	1	Trailer	.....	...	..	50 10	46,000	J. G. Brill Co.
Columbus & Greenville	1	Motor	Gasoline	...	..	.....	.....	J. G. Brill Co.
	1	Trailer	.....	...	..	.....	.....	J. G. Brill Co.
Denver & Rio Grande Western	1	Motor	Gas-Electric	200	40	19 1	76,000	Railway Motor
East Broad Top	1	Motor	Gas-Electric	250	12	24 0	93,700	Company Shops
Frankfort & Cincinnati	1	Motor	Gas	70	26	14 9	30,000	J. G. Brill Co.
Great Northern	1	Motor	Gas-Electric	275	36	17 7	.....	Brill-Westinghouse
	1	Motor	Gas-Electric	275	32	25 5	99,800	Electro-Motive
Lehigh & New England	1	Motor	Gas-Electric	250	81	.....	94,000	J. G. Brill Co.
Lehigh Valley	1	Motor	Gas-Electric	440	21	22 6	132,000	Standard Steel
	1	Trailer	.....	...	78	.....	63,920	Standard Steel
	1	Motor	Gas-Electric	440	21	37 8	132,000	Bethlehem Steel
	1	Trailer	.....	...	78	.....	63,920	Bethlehem Steel
	1	Trailer	.....	...	..	58 0	61,700	Bethlehem Steel
	1	Motor	Gas-Electric	550	26	34 9	137,500	Am. Car & Fdy.—Brill
	1	Trailer	.....	...	78	.....	59,400	Am. Car & Fdy.—Brill
	1	Motor	Gas-Electric	...	..	.....	.....	J. G. Brill Co.
	1	Motor	Gas-Electric	...	..	.....	.....	Electro-Motive
Long Island	1	Motor	Gasoline	68	43	13 10	36,340	J. G. Brill Co.
Mobile & Ohio	2	Motor	Gas-Electric	440	27	20 0	128,860	Electro-Motive
	1	Motor	Gas-Electric	220	40	16 6	97,700	Electro-Motive
	2	Trailer	.....	...	78	.....	59,920	J. G. Brill
New York Central	6	Motor	Gas-Electric	250	40	17 6½	116,500	J. G. Brill Co.
	1	Motor	Gas-Electric	250	74	13 11½	112,000	J. G. Brill Co.
	1	Motor	Gas-Electric	500	69	13 11½	135,000	J. G. Brill Co.
	3	Motor	Gas-Electric	440	39	17 4	127,150	Osgood Bradley
	1	Motor	Gas-Electric	275	74	13 11½	115,000	Am. Car & Fdy.
	1	Motor	Gas-Electric	550	31	22 4	139,500	Am. Car & Fdy.
	2	Motor	Gas-Electric	300	58	22 8½	123,400	Standard Steel
New York, New Haven & Hart.	6	Motor	Gas-Electric	250	90	11 3	103,880	J. G. Brill Co.
Northern Pacific	1	Motor	Gas-Electric	275	32	22 6	104,260	Electro-Motive
	2	Motor	Gas-Electric	275	0	46 9½	101,670	Electro-Motive
Oahu Railway & Land Co	2	Motor	Gasoline	208	62	.....	52,000	Company Shops
Oregon-Washington & Nav	1	Motor	Gas-Electric	275	20	26 0	97,000	Electro-Motive
Richmond, Fredericks, & Potomac	1	Motor	Gas-Electric	550	41	26 3½	135,000	J. G. Brill Co.
	1	Trailer	.....	100	..	.....	65,000	J. G. Brill Co.
Seaboard Air Line	7	Motor	Gas-Electric	275	..	60 0	106,500	Am. Car & Fdy.—Brill
	2	Motor	Gas-Electric	275	..	60 0	109,000	Am. Car & Fdy.—Brill
	9	Trailer	.....	...	96	.....	78,000	Am. Car & Fdy.—Brill
	1	Trailer	.....	...	..	60 0	62,000	Am. Car & Fdy.—Brill
	2	Motor	Gas-Electric	275	..	62 0	106,000	Electro-Motive
	2	Trailer	.....	...	96	.....	78,000	Electro-Motive
Union Pacific	1	Motor	Gas-Electric	...	..	.....	.....	Electro-Motive
Wash., Baltimore & Annapolis	10	Motor	Gas-Electric	...	94	.....	116,000	J. G. Brill Co.

Export

Purchaser	No.	Motor or trailer	Type of power plant	Horsepower	Seating capacity	Length of bagg. compt. Ft. In.	Weight	Builder
Consolidated Railroads of Cuba	4	Motor	Gas	90	38	7 0	30,000	Am. Car & Fdy.—Brill
United Rys. of Havana	8	Motor	Gas-Electric	275	46	11 1	90,000	Am. Car & Fdy.—Brill

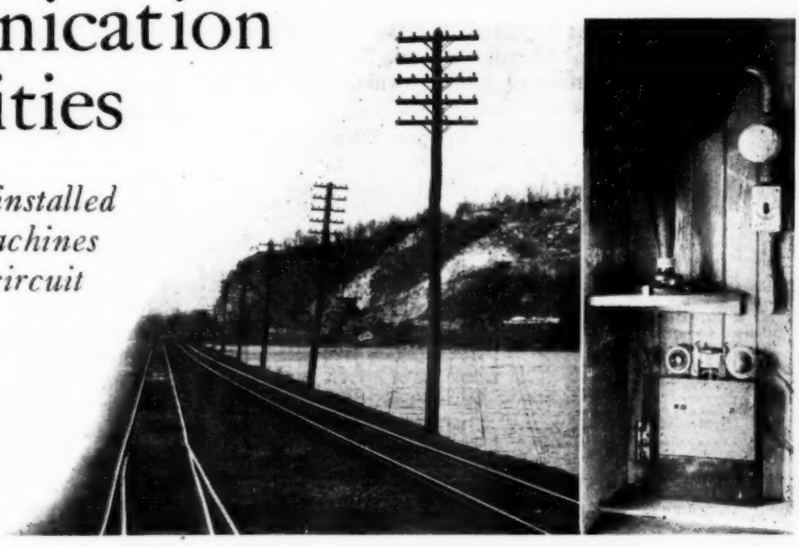
Canada

Purchaser	No.	Motor or trailer	Type of power plant	Horsepower	Seating capacity	Length of bagg. compt. Ft. In.	Weight	Builder
Canadian National	**2**	**Motor**	**Oil-Electric**	300	37	27 3	[illegible]	Can. C. & F. Co. Shops
	1	Motor	Oil-Electric	300	57	15 11	141,400	Can. C. & F. Co. Shops
	2	Motor	Oil-Electric	300	72	7 5	141,400	Can. C. & F. Co. Shops
	1	Motor	Gas-Electric	250	60	14 11	92,380	J. G. Brill Co.
	1	Motor	Gas-Electric	250	40	30 5	98,840	J. G. Brill Co.
	1	Trailer	.....	...	..	34 4	57,880	J. G. Brill Co.
Toronto, Hamilton & Buffalo	1	Motor	Gas-Electric	275	47	16 7	85,000	Can. Car & Fdy.

Year Witnessed Large Extension of Communication Facilities

53,932 miles of copper wires installed —96 printing telegraph machines placed in service on total circuit mileage of 12,300

By R. S. Kenrick
Associate Editor, *Railway Age*



Left—Pole Line on the Pennsylvania. Right—Radio Equipment in New York Central caboose

INCREASED facilities and particularly improved equipment to afford more economical communication service marked the year's activities in the telephone and telegraph departments of the steam railways. The outstanding feature of the past year is the continued increase in copper-wire mileage, the greater part of which represents extensions of telephone dispatching and long distance message circuits. In 1927 the railroads reported an increase of 53,932 miles of copper wire as compared with 39,790 miles in 1926 and 27,757 miles in 1925.

This indicates clearly the present trend toward the increased use of the telephone for expediting train movements and for general message service.

Second only to the large increase in telephone facilities was the notable extension of printing telegraph service. A total of 96 printers were placed in service, on a circuit mileage of 12,300, last year to reduce operating costs. One of the outstanding installations is that on the Southern Pacific which installed two-channel printers between San Francisco, Calif., and Houston, Tex., and New York with drop channels at El Paso, Tex., and Chicago.

Another noteworthy development during 1927 was the installation of a ten-channel carrier current system on the Canadian National between Montreal, Que., and Toronto, Ont., 334 mi., to increase the communication facilities of the commercial telegraph service of the Canadian National. This road also installed a six-channel carrier current system between Toronto, Ont., and Winnipeg, Man., 1,309 mi. A significant feature of this new departure in railway telegraph service is the dual function of the two wires of the physical circuit, these being used also by railway officers for long distance telephone communication. Owing to the re-recent development in mining activities in Canada and the abnormal demand for leased wire circuits it was believed that carrier current equipment would prove more economical than the erection of additional wires between the eastern and western provinces in Canada.

This review which is our eighth annual one of the railway communication field, was compiled from data supplied by 98 leading railroads in the United States and Canada.

Facilities Completed in 1927

In addition to the 35.5 per cent increase in copper-wire mileage previously noted, the year 1927 witnessed a number of other noteworthy increases in facilities as indicated in Table A. The telephone continued to supplant the telegraph for train dispatching purposes, the increase in road mileage being 6,438 as compared to 5,739 in 1926. However, the most significant increase is that in long distance telephone facilities, 24,552.7 miles of such circuits being provided last year as compared to 7,805 miles the year previous. This phenomenal increase of 16,747 miles of long distance telephone circuits, approximately 200 per cent, reflects the 8,432 miles increase on the Michigan Central and the 4,268 miles increase on the Pennsylvania System.

Table A—Principal Increases in Facilities During 1927 Compared with Increases in 1926

		Miles	
		1927	1926
New or rebuilt pole lines:			
Railroad owned	3,103.3		
Commercially owned	4,520.7		
Jointly owned	2,617.1		
Total		10,241.1	9,780.8
Copper wire installed:			
Railroad owned	34,539.2		
Commercially owned	19,393.3		
Total		53,932.5	39,790.0
Iron wire installed		1,542.6	1,816.3
Road mileage dispatched by telegraph		†5,339.7	†4,223.2
Road mileage dispatched by telephone		6,437.6	5,739.5
Long distance telephone lines		24,552.2	7,805.2
Telephone dispatching circuits		20,024.8	*
Telegraph circuits (all types)		147,432.3	*
Printing telegraph circuit mileage		12,299.6	6,512.0
Printing telegraph machines installed		96	*

*Figures not available.
†Decrease.

The increase in telegraph printers is another notable indication of the tendency to provide better and more economical telegraph service. The circuit mileage operated by printing telegraph increased 12,300 miles as compared to 6,512 miles in 1926. The majority of the installations made last year were for yard and terminal service where the circuit mileage is relatively small.

Small Volume of Work Under Construction

A comparatively small volume of work was reported as being under construction at the close of 1927. Eight roads reported constructing or rebuilding 528.5 miles of pole line, 15 roads reported that the telegraph companies were adding 672.8 miles of pole line and 5 roads reported that 765.9 miles of jointly-owned pole line was either under construction or being rebuilt. Additional copper wire to the extent of 3,968 miles was being strung at the end of the year, while telephone dispatching circuits were being increased approximately 1,100 miles to effect an approximately equal increase in road mileage dispatched by telephone in place of telegraph.

Table B—Mileage of Principal Copper Wire Installations in 1927

Road	Railroad owned	Commercially owned	Total
Penna.	6,641.9	451.8	7,093.7
C. N. R.	2,048.0	4,570.0	6,618.0
C. P. R.	1,282.0	4,965.0	6,247.0
S. P. (System)	2,340.0	3,008.0	5,348.0
C. R. I & P	1,910.0	1,350.0	3,260.0
M. P. (System)	2,814.2	302.0	3,116.2
C. M. & St. P.	3,074.0	.....	3,074.0
Southern (System)	1,977.9	454.6	2,432.5
N. Y. C. (System)	1,389.3	427.9	1,817.2
A. T. & S. F.	1,143.1	222.5	1,365.6
N. Y., N. H. & H.	1,220.0	.....	1,220.0
Erie	824.0	380.0	1,214.0
N. & W.	1,148.0	.....	1,148.0
U. P. (System)	771.4	306.5	1,077.9
L. V.	1,005.0	.....	1,005.0
Wabash	73.0	899.0	972.0

Work Contemplated for 1928

Replies received from 36 superintendents of telegraph in response to a *Railway Age* questionnaire indicate a healthy condition of maintenance, both inside and outside. Twenty-six officers reported that their maintenance program this year will be normal or less than normal, whereas 10 telegraph superintendents expect to carry out heavy maintenance and reconstruction programs this year. It is indicated that preference should be given to pole line reconstruction, the general belief being that the outside plant at present deserves a great deal more attention.

Table C summarizes information from 41 roads, but the figures must be regarded as very incomplete because a majority of the roads have not yet finished their budgets for 1928. The copper wire mileage, for example, 20,625 miles, is less than half the total installed in 1927. The last line in the table, however, is a significant one. Eighteen of the 35 machines are reported in the plans of a single eastern road.

Table C—Major Items Reported as Contemplated for 1928

		Miles
New or rebuilt pole lines:		
Railroad owned	1,871.9	
Commercially owned	3,262.7	
Jointly owned	2,006.1	
Total		7,140.7
Copper wire:		
Railroad owned	15,347.4	
Commercially owned	5,277.9	
Total		20,625.3
Road mileage dispatched by telegraph will decrease		1,220.9
Road mileage dispatched by telephone will increase		1,541.3
Long distance telephone lines		6,706.8
Telephone dispatching circuits		1,943.9
Printer circuit mileage		2,807.1
Printing machines		35

Table D lists the roads which are planning the greatest increases in their copper wire circuits.

Technical Developments During the Year

Experimental use has been made of the radio for head-end to rear-end communication on freight trains and for directing hump engines in the past year on the New York Central. Much interest also attaches to an experimental radio-equipped hump yard installation at Selkirk yard on the N. Y. C. where this equipment enables the conductor at the top of the hump to communicate with the engineman in the pusher engine.

Table D—Mileage of Principal Copper Wire Installations Contemplated for 1928

Road	Railroad owned	Commercially owned	Total
C. N. R.	438.0	3,376.0	3,814.0
N. Y., N. H. & H.	2,659.0	.....	2,569.0
U. P. (System)	2,162.5	62.0	2,224.5
S. P.	2,110.0	.....	2,110.0
Erie	1,607.0	88.0	1,695.0
N. Y. C. (System)	1,400.0	.....	1,400.0
C., M. & St. P.	1,302.0	.....	1,302.0
A., T. & S. F.	945.0	70.0	1,015.0
L. & N.	648.0	.....	648.0
N. Y. C. & St. L.	60.0	545.5	605.5
M-K-T	480.0	.....	480.0
B. & M.	20.0	457.3	477.3
G. N.	405.9	.....	405.9
D. & H.	400.0	.....	400.0

The continued installation of the telegraph printer has already been referred to. Improved telephone service has been provided on the New York Central between New York and Buffalo and on the Illinois Central's Chicago terminal by the installation of telephones in boxes on poles, signal bridges, station platforms, etc., for the use of trainmen, signalmen and track maintenance forces. In this way more immediate contact between supervisors and their men is made possible. The telephones on the New York Central are installed along the main line at intervals of about a half-mile.

Due to the extension of railroad electrification on the Philadelphia district of the Pennsylvania, open wires have been replaced with underground and aerial cables, a total of 672 wire-miles being placed underground in lead-covered cable last year. A few roads, including the Pennsylvania, reported additional installations of automatic telephone switchboards for railroad business. The Baltimore & Ohio reported the completion of telephone train dispatching service on its main line between Philadelphia, Pa., and St. Louis, Mo. The New York, New Haven & Hartford reported that its system is now dispatched 100 per cent by telephone. Vacuum tube telephone repeaters on a number of roads have extended and improved long distance telephone service. The Missouri Pacific recently inaugurated long distance telephone service between its general offices at St. Louis, Mo., and the Houston, Tex., headquarters of the Texas and Louisiana lines. Approximately 3,000 miles of wire are involved in this circuit, with telephone repeaters at Little Rock, Ark., Monroe, La., and DeQuincy.

Anticipated Developments

Unquestioned endorsement, with one exception, of the extension of radio to permit head-end to rear-end communication on long freight trains is indicated in 17 replies received from 36 telegraph superintendents. One telegraph officer who expects to see radio employed more generally each year for the speeding up of railroad operation, referred particularly to radio telephone communication from the hump office to the pusher engine in gravity classification yards and to the head to rear-end radio telephone system on long freight trains.

The printing telegraph will be extended for service between points where sufficient communication is handled to justify its installation. It is recommended that printers be installed for broadcasting information at yards and terminals, thus replacing messenger and telephone service. The carrier current system promises marked economy. One telegraph officer suggests that the "telephoto" system be used for the transmission of complicated railway reports.

Foreign Railway Section

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Railways Earn Well in India, page 119

Record Traffic in Argentina, page 121

Britain Slowly Recovering from Strike

By W. H. Fraser, M. Inst. T.
Publicity Agent, Great Western Railway

THE principal task of the British Railways in 1927 has been to restore public confidence in the industry, following on the havoc wrought by the labor troubles of the previous year.

The extent to which the financial resources of the four large British companies had been depleted is clearly shown from the comparative statement of dividends given in Table I.

Table I

Comparative Statement of Dividends Paid on Ordinary Stock—1925 and 1926

Railway	1925	1926
Great Western	7 %	3 %
London Midland & Scottish	6 %	3 %
London & North Eastern (preferred)	5 %	0¼ %
(deferred)	1 %	..
Southern (preferred)	5 %	5 %
(deferred	3½ %	1¼ %

Even to pay the reduced dividends indicated in the above table, the companies had to draw on their reserve funds to the extent of over £17,000,000. Thus closed 1926, a melancholy chapter in the history of British railways.

It will be realized that the companies have had a colossal task to face during 1927 in order to restore their financial position, but from the following table it will be seen that, with one exception, the prices of British railway stocks have not seriously fallen.

Table II

Prices of Ordinary Stock—1926 and 1927

Railway and name of stock	Highest prices 1926	Prices on Nov. 24, 1927
G. W. Consolidated ordinary	92	90
L. N. E. 5% preferred ordinary	63	40
L. M. S. ordinary	78½	71
Southern preferred ordinary	79¼	73

Owing to the delay which has taken place in bringing the new standard charges into operation (referred to later) and the immediate necessity for increasing their revenue following upon the enormous losses of the previous year, the principal railway companies gave public notice on January 14 that they proposed to increase their rates for freight traffic by about 6½ per cent commencing February 1. It is necessary in this connection to state that the railway companies had previously reduced their rates in August, 1923, with the object of assisting a revival in trade, but, unfortunately, in spite of predictions by traders to the contrary, their hopes of increasing traffic as a result of this reduction had not been realized.

It will be appreciated that comparisons with 1926 are of little or no value owing to the abnormal conditions prevailing and it is necessary, therefore, to compare this year's results with those of 1925 in order to arrive at a fair basis of comparison. During the first 45 weeks of the year the aggregate increase in freight traffic receipts in the case of the four large British Companies has amounted to £5,748,000 when compared with 1925,

Coaling Station on The London & North Eastern

but passenger traffic receipts during the same period have decreased by £4,794,000, so that the net increase is only £954,000. These figures are split up among the respective companies as shown in Table III.

Table III

Comparative Statement of Passenger and Freight Train Traffic Receipts—1925 and 1927
45 weeks—ended November 13th, 1927

Railway company	Passenger receipts (decrease since 1925)	Freight receipts (increase over 1925)	Total (increase or decrease)
G. W. R.	£654,000	£1,171,000	+ £517,000
L. M. S.	2,121,000	1,881,000	—240,000
L. N. E.	1,524,000	2,600,000	+1,076,000
Southern	495,000	96,000	—399,000
Totals	£4,794,000(—)	£5,748,000(+)	+ £954,000

Analysis of Results

It will be seen from the table that the Great Western and London & North Eastern show the most satisfactory results, while the Southern not unnaturally shows the principal loss, as it is very largely a passenger carrying line. With these notable passenger losses it was natural that public opinion should imagine that highway competition was responsible and that the peak of railway passenger receipts had passed. As Sir Herbert Walker, general manager of the Southern Railway, has publicly stated: "It is nothing of the kind, and I may say that we are meeting with success in plenty of cases in winning back traffic from the road and in attracting new business." That is the position generally, but the fight between the rail and the road will be long and severe, and cannot be minimized. The reasons for the loss in passenger receipts in 1927 were due to a far different cause than road transport; that industry, from the same trouble and the abnormally wet summer, having also suffered.

There is a large population in Great Britain who use British railways, and who live on the interest on their investments. The months following the strike quickly revealed that practically every industry was compelled to reduce the rate of dividend or pass it for the time being. Table I gives a striking example of the position of thousands of railway stockholders whose livelihood is dependent on stabilized railway dividends and whose

custom it is to take a winter and spring holiday. Railway journeys were ruthlessly cut out and the passenger receipts on railways were speedily affected in the first three months of the year. Another factor was that, though "Wembley" traffic was less in 1925, the provinces were still sending hundreds of thousands of excursionists to the second Wembley Exhibition at low but remunerative fares, and the 1927 returns suffered in the comparison. All through the year, and particularly in manufacturing areas, the need for economy was felt by the working classes, and it is to their credit, that the tightness of money, due to the strike of 1926, was accepted with philosophic patience.

In a remarkable book on the History of the Great Western Railway, just published, Lord Churchill, chairman of the Great Western Railway, writes in his foreword dealing with the railway situation: "One sometimes derives consolation from the knowledge that similar situations were also the lot of our forebears."

British railways have gone through far greater troubles than those with which they are beset today, and if the management, trade unions and staff continue to pull together and co-operate as they are doing at the moment, the irksome situation will be relieved.

New Schedule of Railway Rates

Hardly had the year opened when the Railway Rates Tribunal, which had been set up under Section 20 of the Railway's Act of 1921, to determine questions at issue affecting rates and charges, issued its decision on the new schedule of standard charges, which is to come into operation on January 1, 1928. It will probably be remembered that, under the provisions of the Railways' Act dated 1921, the railway companies of Great Britain were authorized to charge such rates and fares as would bring them in a net revenue equal to that of 1913. Accordingly, the four group companies—Great Western, London Midland & Scottish, London & North Eastern, and Southern—each prepared a schedule of standard charges to come into operation on the "appointed day" (January 1, 1928) for submission to the Rates Tribunal for a decision. The Tribunal has heard a vast amount of evidence both from representatives of the railway companies and the trading community in regard to the proposed charges, and in the main has expressed itself as being in agreement with the railway companies' proposals.

Broadly speaking, the Tribunal has sanctioned the standard basis for freight and mineral rates at 60% above the base rates in operation on January 14, 1920, instead of the 50 per cent basis, plus flat rate additions which have been in force since 1923. In addition, the present "ordinary" passenger fares, 2½d. a mile first-class, and 1½d. a mile third-class, are to be the future "standard" fares. The Tribunal has, however, decided on a scale of workmen's fares, lower than that proposed by the companies. Under the scale settled by the Tribunal, the round-trip workman's fare between places four miles apart will be 5d., 10 miles apart 9½d., and 20 miles apart 1s. 2½d.

Attracting Passenger Business

The year 1927 has proved especially noteworthy in the annals of British rail travel by virtue of a considerable extension of tourist fare facilities and also by reason of some notable developments in the way of lengthy non-stop runs on the part of many of the principal express trains. The latter have been rendered possible as a result of the introduction of new and more powerful locomotives on the part of the companies.

With the primary object of enabling Americans, and other visitors to our shores from overseas, to see the chief historic and scenic attractions which Britain has to offer, the group companies instituted "Circular Tour Tickets," available for two calendar months from the date of issue, covering all places of interest throughout the United Kingdom, at a reduction of 25 per cent on the single fares from point to point. These tour tickets, which in many cases include journeys over more than one company's system as well as trips by road and steamer, have proved very popular with overseas visitors. The tickets have been issued throughout the season from the beginning of May until the end of October, and the public has had nearly 200 different tours from which to make its selection.

Excursion traffic at low fares has been developed by all railways, particularly Sunday excursions. The latest feature is to run week-day excursions to locomotive works, and has succeeded in interesting the public in railway methods.

Competition in Non-Stop Runs

When the summer train services were introduced on July 11, some striking developments were witnessed in the way of really lengthy non-stop train runs. Prior to this date, the record for the world's daily longest non-stop rail run had been held by the Great Western's Cornish Riviera Express between Paddington and Plymouth, a distance of 225.7 miles. Moreover, this record, except for a short period during the war, had held good for over 23 years, but this summer the London & North Eastern and London Midland & Scottish Companies wrested the championship from the G.W.R. by running non-stop to Newcastle-on-Tyne from London (King's Cross) a distance of 268.3 miles, and London (Euston) to Carnforth, a distance of 236 miles, respectively. The Newcastle non-stop was performed during the summer season on four days a week by a relief express, leaving King's Cross at 9:50 a. m., 10 minutes ahead of the "Flying Scotsman," whereas the Euston-Carnforth journey was performed daily in both directions without intermediate stop.

With the introduction of the winter train services on September 26, the London Midland & Scottish improved its service by scheduling its "Royal Scot" express to run non-stop in each direction between London (Euston) and Carlisle, a distance of no less than 299¼ miles, in 5 hours 45 minutes (52 miles per hour) northbound, and 5 hours 55 minutes in the reverse direction. The London & North Eastern withdrew its King's Cross-Newcastle non-stop for the duration of the winter months.

While the great Western has not attempted to exceed its previous Paddington-Plymouth record run, it has still further speeded up its principal express trains this winter as a result of the outstanding success of the new "King George V." class of express locomotives. The Cornish Riviera Express now runs non-stop from London to Plymouth in exactly 4 hours, at an average speed of 56.4 miles per hour for its 225.7 miles' journey, while the Torbay Express covers the 173.7 miles from Paddington to Exeter in 175 minutes, i. e., at the high average speed of 59.55 miles per hour, and thereby maintains its summer timing of 3 hours 35 minutes to Torquay, 200 miles from London. Collectively, the Great Western can now probably claim to have one of the fastest express train services in the world. The Southern Railway has taken the unusual step of maintaining what is practically a summer train service to all the popular resorts served by its system during the winter months. As a result of the large number of express trains run by this company, such places as Brighton,

Eastbourne, Folkestone, and Margate, can now claim to be residential seaside suburbs of London.

The general improvement which has taken place in the express train services of the four group companies this year has been due in the main to the introduction of more powerful locomotives. Americans have had an opportunity of learning at first hand what the Great Western "King George V." locomotive is capable of in the way of speed and haulage capabilities as a result of her trials in the United States following the exhibition of the engine at the "Fair of the Iron Horse" at Baltimore. For hauling the "Royal Scot" express, the London Midland & Scottish has just produced a new locomotive type, with three "simple" cylinders, with the 4-6-0 wheel arrangement. The London & North Eastern Company has rebuilt one of its Pacific class engines, named "Enterprise," and fitted a new boiler in which a higher working pressure has been adopted in order to increase its tractive power.

Comparative particulars of the four latest examples of British locomotive construction on the respective group railways are given in Table IV.

Table IV

Comparative Particulars of Leading British Express Locomotives

Owning company and name of engine	Cylinders (Number)	Boiler pressure lbs. per sq. in.	Tractive effort lb.	Wt. in working order (E & T) lb.
G. W. "King George V"..	4	250	40,300	303,968
L. N. E. "Enterprise".....	3	220	36,465	341,712
Southern "Lord Nelson"...	4	220	33,500	314,048
L. M. S. "Royal Scot"....	3	250	33,150	285,824

Reconstruction of Stations

Quite a number of station reconstruction plans have either been completed or put in hand during the year just past. The Great Western and London & North Eastern have completed their new stations at Newton Abbott (in Devonshire) and Berwick-upon-Tweed, respectively.

The Great Western has just spent £170,000 in remodelling the approach to Paddington Station, its London terminus, which has involved extensive rearrangement of both trades and signals, and in connection with the rebuilding of Newport station (Monmouthshire) the same railway has adopted the "route lever" system of signaling, by which each route, involving the operation of a large number of switches, is set up and the corresponding signal lowered by the operation of a single lever.

The Southern has decided to spend £270,000 in the construction of new freight tracks at Lewisham, near London, in order to facilitate the movement of freight trains passing to and from their own line and those of the northern companies.

Rolling Stock Developments

Principal developments in rolling stock construction have taken place on the London Midland & Scottish and London & North Eastern. The former company has constructed some new coaches for its principal services in which special attention has been given to increasing the standard of comfort for express train travel. Entry and exit are effected by means of end vestibules on each coach as is customary in America, and, by the adoption of larger windows, a much better look-out has been obtained. The London Midland & Scottish has also constructed some new electric rolling stock for its London suburban services in which the open (American style) car has again given place to those of the compartment type.

The London & North Eastern, with a view to meeting highway motor competition more effectively and at the same time reducing running costs to a minimum, has introduced the Sentinel-Camell steam rail car on certain sections of its system with satisfactory results. This company has also just announced its intention of embarking on a big freight car building program.

Irish Railways

Although not directly concerned in the general strike last year, the Irish railways naturally felt the effects of it in the shape of decreased traffics. Highway motor competition is also exceptionally keen in Ireland, and in order to meet this reductions in fares have been made necessary in many cases. Although this has resulted in a gradual recovery in the volume of traffic carried, the revenue has suffered. The Irish railways have also had their share of labor troubles to contend with, and at the time of writing they are at variance with the National Union of Railwaymen over the rates of pay for new entrants to certain grades in the service.

Faster Freight Train Services

R. Bell, the assistant general manager, London & North Eastern Railway, in a recent lecture emphasized the importance of securing increased speed in freight train operation. Mr. Bell stated that one of the great difficulties which stood in the way of securing improved freight train operation in Great Britain was the small average length of haul which was only about one-fifth of that in America. Owing to the close proximity of manufacturing centers to markets there was a natural tendency for traders to expect their goods to be delivered at very short notice without waiting for full car loads, and this was reflected in the very small average revenue earning load carried per car in this country. Among examples of fast freight service Mr. Bell mentioned that freight received in London for transportation to Edinburgh at 2:15 p. m. on Monday was regularly delivered to the consignee at 7 a. m. on Tuesday, the intervening distance covered by rail movement being some 400 miles.

The Great Western has also increased the speed of freight trains. Among recent examples is a night freight train from London to Penzance, which includes an intermediate non-stop run of 141 miles in 3 hours 31 minutes, at an average speed of over 40 miles per hour. The improvement has enabled freight to be delivered in the far west of England some 5 hours earlier than formerly. All the four group companies are giving the closest attention to the speeding up of their freight traffic.

Authority to Operate Highway Vehicles

Perhaps the most interesting railway topic of the moment is the application of the railway companies to Parliament for authority to operate motor vehicles on the highways. They already enjoy such powers in some parts of Great Britain under legislation enacted some years ago, but it is now sought to extend these powers generally to place the railroads on an equal footing with motor vehicle operators. The London Midland & Scottish group, before amalgamation, asked Parliament for these powers, but although the Parliamentary committee which heard the application was favorably impressed, the companies eventually withdrew on account of special clauses required by the Ministry of Transport. An accompanying illustration shows a new Great Western highway motor coach. This company has operated on the highways since 1903.

In the labor world, peace reigns, and in the railway and other industries there is a resolve to let bygones be bygones and to work with a will for the general good of the community.

Lens Station, Northern Railway

1927 Disappointing to French Roads

By M. Péschaud

General Secretary, Directing Committee of Large French Railways

WORK undertaken by the railways prior to 1927 in order to increase the safety and efficiency of operation made considerable progress during the year. The companies increased their efforts to maintain the roadway in perfect condition, particularly to strengthen the lines which are called upon to handle heavy modern equipment. Among the technical improvements the continually increasing extension of the block system on lines not previously so equipped is noteworthy, as is also the extension of the use of repeating signals in locomotive cabs. The further extension of the American telephone dispatching system on a number of lines merits special mention.

On the Paris-Orleans the dispatching system is in service on 250 miles and will soon be on an additional 60. On the Southern it is in use on 80 miles. The company proposes to extend it to other lines. On the State Railway numerous sections have this system and it will be extended to suburban lines along with their electrification. The system is in use on 680 miles on the Eastern, and on the P.L.M. it is in use from Paris to Lyons, Marseilles and Vintimille and between Dijon and Mondane—a total of about 1,240 miles.

Table I—Train Accidents

	Number of Accidents	Killed	Injured
1910	202	97	828
1911	207	60	592
1912	209	60	754
1913	142	60	413
(War Years)			
1919	107	271	1,064
1920	142	122	1,184
1921	72	137	656
1922	49	96	544
1923	39	27	216
1924	47	39	296
1925	82	59	772
1926	92	53	501

The measures taken by the railways to strengthen their lines and to utilize an increasing number of safety devices have had the consequence of diminishing the number of railway accidents in comparison with the pre-war period. Table I shows train accidents year by year for the pre-war period and the post-war period (the Alsace-Lorraine not included in the pre-war).

Improved Rolling Stock Standards

With the purpose of reducing maintenance expenses, the railways have actively pushed, as they did in 1924-1925 and 1926, the application of steel underframes to old cars which had wood or composite underframes. As for passenger cars, there has been little variation—35,326 in 1926 and 35,330 in 1927, as compared with 31,504 in 1914.

The substitution of electric lighting for gas having been completed the year previous for cars which might be used in high speed trains, the railways are now installing this equipment in suburban and local cars. Trials of radio telegraphic communication with trains in motion, begun in 1922, has been continued with success.

Refrigerator transportation service continually progresses. Before the war there were scarcely 350 cars so classified and there was nothing of the refrigerator about most of these except the name—in fact there were only 100 which could be utilized as such in 1914. Great progress has been made from a technical standpoint in this situation. At the present time the number of refrigerator cars on the State, the P. L. M., the P. O. and the Northern nearly reaches the figure 3,000.

Air Brakes in Freight Service

As a result of a government order, the directing committee of the large railways has decided to apply the Westinghouse air brake system to freight trains. According to the estimates of the railways, the total expenses of the first installation will reach 1,600 million francs for all the lines and annual operating expenses will be increased 78 million. Economies possible in the first place will be a reduction in the number of employees required to operate trains. This may be estimated at about 80 million francs. Moreover, there may be some economy in the reduction of damage to merchandise and equipment. The new brakes will work less suddenly

than the hand brakes. Finally, the tonnage of the trains can be increased and the power of the locomotives will be better utilized. The work of equipping the cars with the brakes will be entrusted in part to French industry and in part to that of Germany, by application of the Dawes plan. The railways estimate that five years will be required for the completion of this program. They are now negotiating a division of the expenses among themselves and the government.

Financial Conditions Slow Up Electrification

Because of the monetary crisis and the high interest rate the companies have slowed up or stopped entirely their programs for electrification. But before this enforced decision was made they succeeded in realizing one stage of their program—approximately 621 miles have been electrified. In the suburbs of the capital the State Railway has changed 100 route miles to electric operation—Paris to Saint-Germain and Paris-Bois-Colombes—and will soon have completed the work as far as Argenteuil. The P. O. has in electric operation the line between Paris and Vierzon (127 miles). The Southern has finished the electrification of the Bordeaux-Hendaye line (144 miles), the Dax-Toulouse line (188 miles), and a part of the Pyrenean lines. As for the P. L. M., it has commenced the electrification of the Chambery-Modane line (61 miles) which will be carried through to completion, electric locomotives to be used there probably in the early part of 1928. Moreover, trials of high speed electric locomotives have been made in the neighborhood of Saint-Pierre d'Albigny.

M. Tardieu, the minister of public works, is making every effort to find a solution for the financial situation which has stopped the work. It is by recourse to reparations that he hopes to avoid the postponement of the great railway electrification scheme which forms a part of his general and national industrial improvement program. The provision of electrification material demanded from Germany as reparations should permit an escape from the difficulty, at present insoluble, of securing the enormous capital necessary to pursue the improvement.

The last section of this improvement will concern about 870 miles and will include: on the Southern, the completion of the Pyrenean lines; on the P. O., the continuation of the electrification of the Paris-Vierzon line as far as Limoges (250 miles); on the State Railway, the suburban line around the capital (about 175 miles); and finally, on the P. L. M., 185 miles, Carnoules to Vintimille, the first section of the Marseille-Vintimille line. The total for the two sections is about 1,500 miles of electrified line, which can be completed if financial conditions permit it, under the present plans in a maximum period of 6 years.

Deficit After Charges in 1927

As for capital expenditures the railways, because of the high interest rate, have restricted themselves to borrowing only where absolutely necessary. By virtue of the agreement of June 28, 1921, after "a transitory period"—the first six years—the railways were supposed to be self-supporting from the charges collected for their service, but in waiting until the adjustment of rates produce this effect the government should advance to the railways the sum necessary to cover the deficits, these advances to be repaid within two years. In 1926 operations ended with a surplus of 534 million francs. This was the last year of the transitory period and it was hoped that the era of deficits had come to an end. Unfortunately the slowing up in business which began in December, 1926, and the end of which cannot as yet be foreseen, has brought material reductions in traffic and the present year will close with a considerable deficit. The operating results are shown in Table II.

Table II—Earnings in Millions of Francs

	1926				1927 (Estimated)			
Railways	Rev.	Exp.	Capital charges and oper. pre-miums	Surplus or deficit	Rev.	Exp.	Capital charges and oper. Pre-miums	Surplus or deficit
Northern	2,088	1,517	430	+141	2,156	1,690	453	+ 13
Eastern	1,818	1,302	314	+202	1,860	1,460	320	+ 80
P. L. M.	3,690	2,652	712	+326	3,600	2,844	756	0
P. O.	1,745	1,373	486	—114	1,715	1,476	388	—149
Southern	850	621	239	— 10	858	693	255	— 90
Alsace-Lorraine	1,006	786	115	+105	1,014	845	130	+ 39
State	1,965	1,713	368	+116	1,983	1,912	385	—314
Total	13,162	9,964	2,664	+534	13,186	10,920	2,707	—421[1]

[1] Not including interest charges on deficits from 1921-25, which are about 500 million.

Table III shows total gross receipts for the railways from January 1 to October 21, 1927, compared with corresponding receipts of the previous year.

Table III—Comparative Gross Earnings

(Thousands of francs)

Railways	Total receipts Jan. 1–Oct. 21	Comparison with 1926 Totals	Per km (%)
State	1,355,398	+ 31,975,000	+2.10
P. L. M.	2,886,770	— 22,540,000	—1.04
Northern	1,712,800	+ 59,125,000	+3.58
Orleans	1,383,418	+ 14,322,000	+1.04
Eastern	1,456,849	+ 50,709,000	+3.61
Southern	661,400	+ 19,948,000	+3.06
Alsace-Lorraine	804,300	+ 21,399,000	+2.60
Total	10,460,935	+174,938,000	+1.62

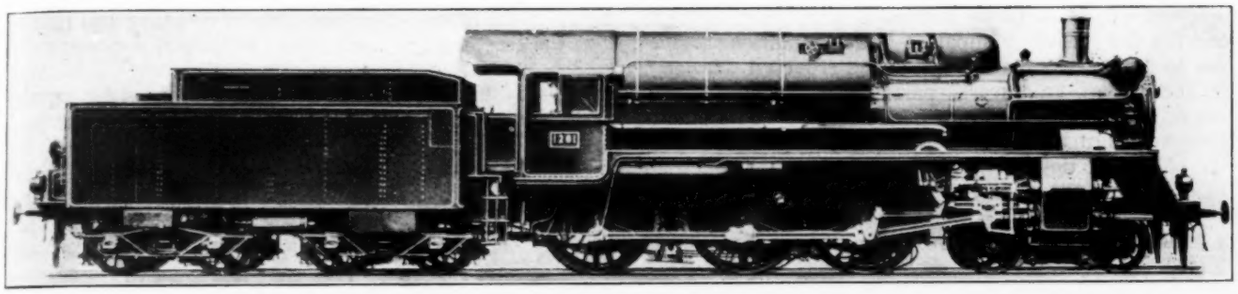
This slight increase of 175 million francs and 1.62 per cent in gross receipts in 1927 shown in Table III when compared with 1926 is deceiving, the operation at the present time having had the benefit until August 16 of increases in rates which were not in effect in 1926. In reality there has been an important decrease. If one considers not only the gross receipts but the "basic" receipts as well, that is to say the basic rates to which the percentage increases have been added, one sees that in 1927 as compared with 1926 from January 1 to October 21 there was a decrease of 371,837,000 francs or about 12.5 per cent in receipts from the basic rates. Average car loadings in 1927 are running about 5 per cent lower than in 1926.

Several causes have contributed here-of-late to the decline in railway traffic and consequently to the decline in railway receipts. Among these we may mention, in addition to the general depression in business, three others which are important, namely, the competition of highway vehicles, the competition of the waterways and the excessive transportation tax.

High Transportation Tax

The railways, on the other hand, are severely burdened by the transportation tax. The law of August 3, 1926, which set up a scale of taxation for railway passengers fixed the rate at 32½ per cent for passengers and baggage and at 65 per cent for special accommodations (parlor car seats, etc.) and 11½ per cent on freight.

While the public treasury of France levies a tax of 32½ per cent on passenger fares and 11½ per cent on the average on freight, the levy on passengers is only 20 per cent in Czechoslovakia, from 10 to 15 per cent in Germany, according to the class of accommodation, and 5 per cent in England. On freight the tax is 15 per cent in Czechoslovakia and 7 per cent in Germany. In Belgium, Denmark, the Netherlands, Italy, Norway, Poland and Switzerland there are no railway transportation taxes on either passengers or freight. England has no tax on freight service.



High Pressure Locomotive Built by Henschel & Son

Satisfactory Progress in Germany

By Dr. Alwin Sperber
Archiv für Eisenbahnwesen

THE year 1927 is the third in which Germany's railways have been operated by the German National Railway Company (Deutsche Reichsbahn-Gesellschaft). In taking over the railways, the administration considered as its most important task the earning of revenues to be applied to the payment of reparations, while at the same time protecting the interests of German industry. Prior to that time the railways were in the hands of the states and the federal government and were operated rather to aid industry in general than for the purpose of producing profits in themselves.

Financial Obligations of the Railways

The calendar year 1927 embraced the last two-thirds of the third and the first third of the fourth reparation year.* This is the first "standard" year in which the 660 million gold marks as interest and amortization on the 11 billions of promissory notes issued by the National Railways is to be written off as provided by law. As the fiscal year formed a part of the first "standard" year, an amount of 590 millions was required for interest charges and current maturities of the promissory notes. Added to this were 62 millions for dividends on the preferred stocks already issued, as well as 100 millions as a sinking fund which must be collected at the rate of 2 per cent of the annual receipts in accordance with legal regulations to form a fund of 500 million marks—altogether about 752 million marks. In addition there was a total of 250 millions which had to be paid as a transportation tax, complicating the statistics of the company and necessitating an increase in passenger and freight rates.

Heavy Pensions Payments

The position of the National Railways was further rendered difficult in 1927 by the fact that it inherited certain political burdens which could not be avoided. In the field of labor expense must be mentioned the pensions and subsidies for retired employees who were employed immediately after the war as a demobilization measure, over and above actual railway requirements, and who would never have entered the service of the railway in normal times. Accordingly, much more than normal amounts have still to be paid out in wages.

In the year covered by the report, no disturbances arose from the point of view of labor conditions. The development of traffic was favorable. In 1926 receipts were very irregular—the first half-year witnessing a disquieting fall in operating revenues, recovery coming only in the second half-year, when the English coal strike brought an unexpectedly large coal traffic. The year 1927 on the other hand saw a steady increase in operating receipts with the improvement of business conditions, which have evidently now reached the peak. At any rate, the total estimated receipts for 1927, 5 billion marks, will be earned, so that the fulfillment of the reparation burdens devolving upon the National Railways is beyond question.

Rate Reductions

This result need not, however, lead to an especially favorable financial conclusion, for in the course of the year circumstances arose which brought additional burdens on the railways which could not be avoided, and the full effect of which were not felt in the past year. On August 1, 1927, changes in freight rates, long demanded by the business world, were made which will result in an estimated decline in revenue of from 70 to 75 million marks. The new rates do not involve a general reduction, such as has often been asked as a stimulus to business. Such a decrease would mean a burden which the National Railways cannot carry at present and would have redounded to the benefit of industries, the needs of which for such help cannot generally be recognized. The new rates cover rather only ameliorations in cases which were accentuated by the change from conditions of inflation to those now obtaining. They involve reductions on the higher classes of freight which were burdened especially heavily during the inflation period for the benefit of the lower freight classes. The new rates, moreover, bring about certain reductions for short distances up to 100 kilometers (62 miles), which rates were previously high as compared with greater distances.

Staff Personnel Salary Increases

A further financial difficulty falls upon the railways through increases in salaries of the staff, which run along the lines of a general wage readjustment in the government and state service, which readjustment is likely to be retroactive to October 1, according to the promises made some time ago. Of more than 700,000

* See articles on the German railways in the annual statistical numbers of the *Railway Age* for 1927 and 1926.

employees of the National Railways, more than 300,000 work for the railway companies under conditions analagous to those of government and state civil service.* For these staff employees, particularly for the lower groups, salary increases became necessary. The stabilization of German currency was possible at the end of 1923 only by reducing the general wage level and such a sacrifice on the part of the staff could be tolerable only for a short time. Even though in 1924 a certain improvement took place, it was very small, for it was limited by uncertain economic conditions. While, since 1924, the standard of living has risen slightly and the wages of workmen have followed it in general, the salaries of staff employees remain unchanged, so that there was increasing destitution among them, the alleviation of which has been for a long time in contemplation. The National Railways therefore decided upon a readjustment of staff salaries in conjunction with the government, the states and communities. The additional charge on the railways will amount to about 4 per cent of the expenses.

In considering the difficulties which face the National Railways, highway competition must not be overlooked. Automobile traffic has already caused considerable losses in receipts in passenger and freight traffic. In 1928 there will probably be some progress in the adoption of measures which should end unsound competition by coordinating railway and highway service, assuring the National Railways considerable influence over highway traffic. In this improvement experience gained in America must be taken into consideration. In the meantime, however, the competition is being felt more and more, for in Germany the truck particularly is still in development. And we must look in the future for a continued fall both in the purchase price and in operating costs of highway vehicles.

The circumstances described force the railways this year to careful economy, particularly to an extraordinary conservatism in the improvement of existing or in the construction of new structures. The strengthening of bridges which has been going on for several years because of the contemplated increase in axle loading could therefore be carried on only to a modest extent. Only a few important bridges were built. In these structures further successful use was made of a special high grade structural and silicium steel.† According to experience thus far gained it is to be expected that in the near future the silicium steel produced in the Bosshardt furnace can be produced in similar good quality in the open hearth furnace. Silicium steel for two of the newest bridges has already been made in open hearth furnaces. Altogether the National Railways have now used 5,500 metric tons of silicium steel and 95,000 tons of the special high grade structural steel, "St. 48."

Equipment Maintenance Methods

During the past year much attention was devoted to increasing efficiency in all departments, especially in operating methods. Great progress was made in specializing car shops to one particular type of car. The preparation for the work, that is the determination of the work to be done and the time necessary for it, is the necessary prerequisite to the development of time studies and schedules. The utilization of systematic time studies, which were expensive to make, brought considerable savings.

The first results of the new methods have already been secured in the improved performance of cars and locomotives, especially the lengthened time between shoppings of the latter. New methods of cleaning and painting, the treatment of used tires (welding), springs, axle bushings, etc., were successfully introduced. Also the process of manufacture and repair of important repair parts, instruments and tools, was in many instances improved. Whatever may be produced or maintained in a central location is handed over to a few shops rather than scattered over the entire system. Efforts also were made to raise the efficiency of locomotives, which the railways do not themselves build. There was a reduction in locomotive purchases.

Types of locomotives developed by the National Railways which were built during the year include passenger locomotives and freight locomotives for branch line service with 15 metric tons axle loading, as well as new switching locomotives. Furthermore, additional express train locomotives for passenger and freight service, both types with 20 metric ton axle loading, were built following successful trials last year. The efficiency of locomotive performance has been improved by the introduction of these locomotives. A two-cylinder express locomotive was tested which showed a high fuel efficiency; the highest power output was found to be 2500 h.p. In the usual power range of 1000 to 1200 h.p. the 2-cylinder locomotive was found to be even more economical in steam consumption than its 4-cylinder compound counterpart. The standard freight locomotives of which the first to be built had three cylinders, later were changed to a two-cylinder design and obtained equally favorable fuel efficiency. The experience obtained with two- and three-cylinder freight locomotives was again confirmed, namely that the two-cylinder locomotives gave about 5 per cent better steam consumption values than the identical locomotives equipped with three cylinders.

That the National Railways put particular emphasis on reducing fuel consumption is explained by the fact that as contrasted with American conditions, in Germany fuel costs represent 30 per cent of the total cost of locomotive operation.

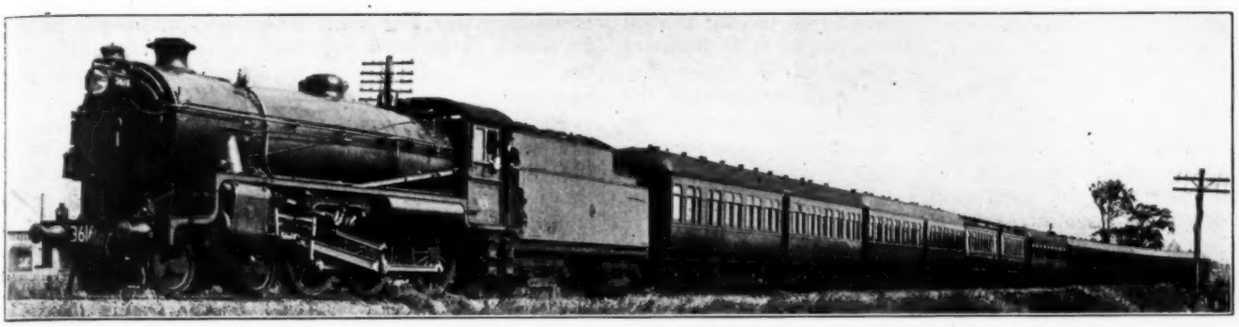
Of the novel locomotives being constructed or experimented with the following should be mentioned: A turbine locomotive with 323 lb. and another with 882 lb. working pressure. Furthermore, a three-cylinder express locomotive which has been tested is especially promising, permitting the hope of a 30 per cent fuel saving at a working pressure of 882 lb.

At the same time a method has been sought for reducing costs on existing locomotives equipped with the standard boiler, using a lower priced fuel, namely pulverized coal. Two freight locomotives using pulverized coal have shown a favorable efficiency.

The above touches upon but a few of the recent important developments on the German National Railways. If the idea has been given that the railways must perforce operate economically, emphasis should also be given to the fact that the company is striving also to improve its efficiency in the interest of passengers and shippers—in freight traffic, especially the speed of the service; in passenger traffic, the comfort of the passengers. This improvement is desirable from the competitive point of view, for the German railways, aside from the competition of the motor car, must also consider the maintenance of their position by the quality of their service in competition with non-German railways.

What will happen on the German railways during 1928 is hard to forecast. Even though traffic conditions have experienced a favorable development in 1927, it is not certain that they will continue. Certain signs warn us to take care in predicting the future and the National Railways will have to proceed cautiously.

* See *Railway Age*, January 2, 1926, page 134.
† See *Railway Age*, January 1, 1927, page 155.



Express Passenger Train on N. S. W. Government Railways

Steady Progress in Australia

By W. H. Newman
Information Officer, New South Wales Government Railways

THE Australian and New Zealand railways are modern and efficiently conducted transportation services and are owned by the respective states. In considering their operations, however, it must be borne in mind that some 25,000 miles serve a continent equal in size to the United States, but populated by less than seven million people. It is these factors—huge size and relatively small population—that make the problems of economical railway operation perhaps more difficult in the Commonwealth of Australia than is the case in the more densely populated countries of the world.

With the exception of the Transcontinental line (linking the Eastern states with the State of Western Australia), which line together with an isolated section of railway in the tropical Northern Territory, is owned and operated by the federal government, the railway mileages lying within the borders of each of the six Australian states are owned and operated by the state concerned, management being by a board of three commissioners in New South Wales and Victoria, and by a commissioner in each of the other states. A commissioner also administers the federal railways. Co-ordination between the various separate railway systems is to a large extent secured by means of annual conferences attended by the chief administrative officers and the commissioners of all systems, including New Zealand.

The Dominion of New Zealand, consisting mainly of two islands with an area of 103,861 square miles, and distant a little over 1,200 miles from the eastern shores of Australia, has a population of one and a half million people. The railway system which totals 3,138 miles, is of 3 ft. 6 in. gage throughout, and as in Australia, is state-owned, control being vested in a board of management consisting of a chairman and two members.

Unfortunately the railways on the mainland of Australia have not been constructed to one gage, and today Australia is experiencing what the United States went through prior to 1886 when it was decided that the only effectual means of overcoming the disadvantages of the break of gage was by establishing uniformity. There are today in Australia four gages, viz.,—5 ft. 3 in., 4 ft. 8½ in., 3 ft. 6 in., and 2 ft. 6 in. It has been decided to standardize on the 4 ft. 8½ in. gage, and a commencement has been made with this work of unification. A new 4 ft. 8½ in. gage line, 97 miles in length, is now under construction, extending from a point on the North Coast line of New South Wales, across the Queensland border to Brisbane. On completion of this line there will be a 4 ft. 8½ in. gage railway between the capital cities of Sydney (New South Wales) and Brisbane (Queensland), a distance of about 620 miles, and the time of journey between these two cities will be shortened by about six hours as compared with the time necessary at present by the existing line, which necessitates a break of journey at the Queensland border, and a transference from the 4 ft. 8½ in. to the 3 ft. 6 in. gage line.

American Standards Being Adopted

Until recent years the Australian and New Zealand railways have followed closely British practice. Today, however, American practice in respect to the building and use of cars of the greatest practicable carrying capacity is engaging the serious attention of all systems, and replacement of the smaller capacity and less efficient freight cars by those of modern design is taking place. On the South Australian Railways the rolling stock now comprises steel gondola cars of 40 long tons (long ton = 2,240 lb.) capacity, box cars of 30 tons, and flat cars of 50 tons' capacity. The Victorian railways are operating 20 and 30-ton capacity cars for general traffic, and 40-ton cars for metal, sand, grain, etc., while on the New South Wales railways the double-truck freight cars are of 40 tons and open cars of 25 tons' capacity.

The most notable locomotive development has taken place in South Australia in connection with the policy of modernizing the railways, ten Mountain, ten Pacific and ten Mikado type locomotives, the latter equipped with the booster, having been imported from England. Notable performances for Australia have been made with these locomotives, a Pacific type having hauled a load of 923 long tons and a Mikado type a load of 1030 long tons over difficult sections of line. In addition a considerable saving has been effected in light and helper engine mileage.

New South Wales and Victoria continue to operate their main line passenger trains by locomotives of the 4-6-0 type with a tractive effort of 30,500 lb. and 25,867 lb. respectively, the former state having recently placed in traffic 60 of an improved design. Victoria has under construction a Pacific type 3-cylinder locomotive for use on interstate expresses, and this system was the first in Australia to use a locomotive equipped with a

booster. Trials with a light Mikado type having proved successful, arrangements are being made to fit boosters to the heavy 2-8-2 type freight locomotives under construction. Another development in this state was the importation of two 2-6-6-2 Garrat type locomotives for working feeder lines of 2 ft. 6 in. gage. These locomotives each have a tractive effort of 25,270 lb., and as the narrow-gage rolling stock has been fitted with automatic couplers of a light M. C. B. type, excellent results have been secured by their use.

Rail Motor Cars

Australia being a comparatively new country a considerable mileage of railway has been constructed for purely developmental purposes, this mileage including spur lines serving sparsely populated districts. To provide efficient transport facilities, and at the same time materially reduce operating expenses, the various systems are making considerable use of rail motor cars. New South Wales and Victoria have developed a type of gasoline driven rail car considered the most suitable for local requirements, these being of standard design, and, with the exception of the motor, constructed in company shops. The design in both states is somewhat similar, the body being carried on two trucks and provided with double-end control. The South Australian rail motors are of steel construction, and of a different design from those of the other states. They are of the "Brill" type, and were imported from America.

In addition to rail motors of the McKeen type, Queensland is operating both steam and gasoline driven rail cars, the design of the latter being a departure from the general accepted idea of a railway car, presenting an appearance similar to that of a highway motor coach. On the isolated section of railway in the Northern Territory the Commonwealth Railway Department has in traffic a Sentinel-Cammel steam motor car. This type of vehicle, as well as Clayton steam rail coaches, is also used in New Zealand on lines carrying a light traffic.

Railways Engaged in Motor Transport

The Victorian Railways have entered into active competition with road motor services affecting rail traffic, the policy being not only to operate highway coaches as feeders to the railway, but where people insist upon traveling by road to provide such service. Many such lines are now operated, and it is hoped by maintaining a high standard of service to win back a lot of traffic that has been lost. The South Australian Railways are also actively combating road motor competition by the provision of motor services for passengers, freight, parcels and luggage. The passenger service includes both single and double deck buses for short distances, and parlor coaches for the longer hauls.

Passenger Travel

Two of the capital cities, Sydney and Melbourne, both have a population in excess of one million people, the transportation of which, as well as that of the other capital cities, is to a large extent furnished by the suburban mileage of the various railway systems. The suburban passengers of Sydney are distributed throughout the city at three stations, and in the year ended June 30, 1927, last over 130 million passengers were carried, being an increase of over 10½ millions on the previous year. This increase was made despite intense road motor conpetition, and was largely due to the electrification of a portion of the system, and the opening of the first section of the City Railway (a subway).

The electric suburban service of Melbourne, Victoria, now comprises 163 route miles, and additional sidings are being fitted with overhead equipment in order that the freight business may be operated by electric locomotives.

In New South Wales work is proceeding on the conversion to electric traction of over 116 route miles of the Sydney suburban system, including enlargement of the clearances to allow for the bigger rolling stock, and additional tracks for handling foreseen traffic of the immediate future. Three lines, comprising 39 route miles, are now electrified. Power from the main generating stations is converted at sub-stations to direct current, which is fed at a potential of 1,500 volts to the overhead wire giving supply to the traction motors of the cars. Linked up with the electrification scheme is the construction of the City Railway. The first section of this underground loop was brought into operation in 1926 with the extension of the electric services from Central Station, one of the two underground stations being utilized as a temporary terminal. Work is proceeding on the remaining sections, and completion of the railway will synchronize with the opening of the Harbor Bridge (under construction) giving connection to the Northern suburbs of the city. The magnitude of these schemes, which it is hoped will prove a solution to the city's rapid transport problem, can be gaged from the cost, which is approximately,—

Sydney Harbor bridge	£4,000,000
City Railway	6,950,000
Electrification and widening of the suburban lines immediately necessary	8,981,000
New rolling stock	5,805,000
Total	£25,736,000

Shop and Manufacturing Facilities

Three of the systems have made large additions to their shops and manufacturing plants. New South Wales is constructing large modern shops on an area of 485 acres at Chullora, 11 miles out of Sydney, to which the whole of the railway shop work in the metropolitan area is to be transferred. The completed work comprises a boiler shop with a floor space of 80,000 sq. ft.; shops manufacturing all signaling appliances; and car repair shops dealing with the equipment and maintenance of all electric rolling stock.

The South Australian Railways have completed new shops at Islington for locomotive construction and repairs. Construction operations have been transferred to the new steel car department, and the fabricating and assembly shops have recently completed new 50-ton steel cars. The remainder of the Car department shops is practically completed. A reclamation department has also been provided together with new bulk stores.

The Victorian Railways have completed a new general storehouse, together with a reclamation plant, in proximity to the Newport locomotive workshops. This new storehouse consists of a single-story building 365 ft. by 165 ft., constructed of precast concrete blocks, with covered platforms 10 ft. wide extending the length of the building on both sides. The whole system of storekeeping has been revised incorporating the best features of modern practice. To cope with the increase in boiler construction and repair work at Newport locomotive shops, a new boiler shop has been constructed 800 ft. long by 170 ft. wide. A special pattern of steel column with extensive gullage foundations was used in order to provide for the supporting structures bearing the weight of heavy lifting cranes. Progress has been made with the new shops at Spotswood for the maintenance department, the Ironworks section having been completed during the year.

Railways Earn Well in India

By *Railway Age's* Correspondent in India

Near the Northern Frontier of India

FOR the fiscal year ended March 31, 1926, the net gain in the central government of India from the operation of state-owned railways was over 30 million dollars of which about 18 million dollars were appropriated by general revenues in terms of the agreement for the separation of railway from general finances, while the remainder was transferred to the railway reserve fund. According to this agreement, the railway finances are separated from the general finances of the country, and the general revenues receive a definite annual contribution from the railway which shall be the first charge on the net receipts of railways. The contribution will be based on the "capital at charge" and operating results of commercial lines and shall be a sum equal to 1 per cent of the capital at charge of commercial lines plus one-fifth of any surplus profits remaining after payment of this fixed return. If the amount available for transfer to the railway reserve fund exceeds in any year 10 million dollars, only two-thirds of the excess over this sum will be transferred to the railway reserve and the remaining one-third will accrue to general revenues. Various other details are laid down concerning the power of railways to raise loans for their own use, etc. It will be seen from the results during the year that the state-owned railways were a valuable asset to the government of India and provide an important sum towards the general revenues of the country.

For the year ending March 31, 1927, the net gain to the central government was over 26 million dollars of which about 20 million were appropriated by general revenues. The results were not as good as those in the previous year but still it was possible to add over 6 million dollars to the railway reserve fund.

Since April 1, 1927, there has been a considerable improvement in earnings and up to the end of September there was an increase of over 5 million dollars in gross earnings as compared with the previous year. There has been a general improvement in traffic and this has resulted in an increase in passenger earnings as well as in freight. Earnings from the carriage of coal, grain and pulses have gone up but there has been a slump in cotton and also a decrease under oilseeds.

Passenger Business Increases

The number of passengers handled continues to show an increase and there was an increase of 22½ millions in the number of passengers carried during 1925-26 as compared with the previous year and an increase of 5 millions in the number of passengers carried during 1926-27 as compared with 1925-26. It is interesting to note that 578 millions out of the total of 604 millions carried during 1926-27 were carried at an average rate of 0.55 cents per mile, and in spite of this low rate, the Indian railways earned a profit.

One difficulty is met with in India and that is the large number of passengers who travel without tickets. In 1924, 2⅓ million passengers were detected traveling without tickets and the figures during 1926 were much the same. This has led to the introduction of a new system for the collection of tickets which has been called the "crew" system. This consists of a number of ticket checkers traveling on each train and the collection of all tickets on the train and not at stations. This is common in other countries, but the system in India differs from others in that it is based on stopping passengers entering the cars without tickets. Ticket checkers are not allowed to collect cash from passengers without tickets and so it is possible to check the work of the crews. In India there are no corridor cars, and it has been necessary sometimes to allot one man to each car on busy trains. The results so far have shown that the extra earnings have more than counter-balanced the extra expenditure.

Important Expansion Program

India has gone in for a large policy of railway expansion and probably more lines are under construction in India than in any other country in the world. During 1925-26 a total of 341 miles were opened to traffic while during 1926-27, 421 miles were opened. During the latter year 2,256 miles were under construction and 599 miles had been sanctioned, but construction had not yet commenced. Since April 1 various other proposals have been approved of and it is hoped rapidly to speed up the construction of new lines.

The biggest program of railway expansion is in Burma where 650 miles of new construction will be begun and the total program is over 1,600 miles. The actual mileage opened in Burma is at present only 1,822.

The total mileage of projects which the Railway Board had either sanctioned or were under investigation by the end of March, 1926, amounted to between 6,000 and 7,000 and it is hoped that when all arrangements are in full swing, the total yearly addition to the mileage of Indian railways will be in the neighborhood of a thousand miles. At the same time steps are being taken to electrify certain of the services, especially where heavy grades are met with or where there is a heavy suburban traffic.

Rearrangement Under Government Operation

As a result of the Indian government taking over the direct management of company managed railways, the Great Indian Peninsula Railway being the last to be taken over on July 1, 1925, 13,549 miles are now directly managed by the state out of a total of 39,049 miles. This is in accordance with the policy expressed in the Legislative Assembly, which corresponds to the Congress in America. The taking over of the Great Indian Peninsula Railway has made it possible to rearrange the areas under each railway so that those sections which form

naturally a part of the railway system may be controlled by the administration of that system.

For example, in 1925 the taking over of the East Indian Railway allowed its amalgamation with the Oudh & Rohilkhand Railway and the handing over of the Delhi-Ghaziabad section of the East Indian Railway to the North Western Railway, while the North Western Railway also took over the operation of the Delhi-Amballa-Kalka railway which was formerly under the East Indian Railway. The taking over of the Great Indian Peninsula Railway allowed the East Indian Railway to hand over the Naini-Jubbulpore section of the East Indian Railway to the Great Indian Peninsula Railway.

Interchange and Rates

An experimental clearing house for the Indian railways has been introduced for dealing with interchange traffic between the various state railways and in the course of this experiment an entirely new method was evolved which promises to secure the same results as the existing system with a substantial reduction in the cost of clerical establishment. This method consists in dividing the traffic interchanged between the railways in the proportion of ton-miles and in doing this work on tabulating and sorting machines.

A Rates Advisory Committee has been established as a result of the recommendations of the Acworth committee; it consists of a president, one member representative of shipping interests and one member representative of railway interests, and its duty is to adjudicate upon disputes between the railway and the public in the matters of rates and fares levied by the former and to submit proposals to the Railway Board.

Standardization of Equipment

The question of standardization of equipment has been studied by Indian railways for some time, and there are now standing committees of officers for the standardization of locomotives, rolling stock, permanent way, bridge work, signals and interlocking, and a considerable amount of work has been done in drawing up suitable designs and in trying them out.

Training Future Officers

India has not the facilities which are found in America and England for the training of railway officers and so much more must be done by railways themselves. The marked development of the science of transportation and the equipment of railways and the insistent demand for reduced rates and fares together with the increase in operating expenses which post-war conditions has imposed in every quarter of the globe, has brought prominently into view the need for increased efficiency in operation. It follows that not only must the material be of the best, but that a higher standard must be obtained from the staff who have to handle it, and it is to meet this problem that the Railway Board has devised a system of transportation schools which will give the staff much fuller instruction in transportation duties than has been attempted hitherto. The foundation of the proposal is a system of "area" schools. These schools have two distinct functions:

(a) The training of probationers who have not yet commenced their railway service, and

(b) The provision of periodical "refresher" courses for those already in the railway service, certificates being granted on the results at the end of each course.

The "area" schools will provide the primary education under this scheme; the secondary education, naturally of a more advanced type, will be the business of a central school which will take the more senior men who have already passed through the area schools and will in addition provide instructions for probationary officers and refresher courses for officers.

This central school was started at Chandausi as buildings were available there but during 1927 a further step has been taken by the Railway Board and sanction has been obtained to put into operation a scheme for the establishment of a Railway Staff College at Dehra Dun. This staff college will be a center where railway problems can be studied and where expert transportation knowledge can be disseminated. Each officer on recruitment will have to undergo a period of practical training, in which railway work will be sandwiched with a course at the Railway College. The college will also conduct courses for selected senior subordinates to fit them for promotion to the superior service in accordance with the new recruiting scheme under which it is the intention to fill a percentage of the vacancies by promotion. Further the college will undertake the training of selected subordinates and officers for posts as instructors in the various area schools.

Revised rules have lately been drawn up for the recruitment of new officers and the standards expected from men who are anxious to enter railway service are laid down. Generally speaking the intention is that all officers for the operating and traffic departments will have received an engineering training and must be in possession of a suitable degree. They will then be taken in hand and trained in their new duties as operating and traffic officers.

Divisional Organization Adopted

All state managed railways in India have now definitely adopted a divisional organization with the exception of the Eastern Bengal Railway where this organization will shortly be introduced. The results obtained during the last two years have proved conclusively that there are many advantages in a divisional organization in a country like India where distances are large and where it is essential that some officer should have the power to settle most of the problems which arise without reference to headquarters.

The organization generally adopted is the strict divisional organization as far as the division itself is concerned, but the higher organization differs from the usual American practice to suit local conditions. There is no general superintendent over the divisional superintendents and all divisional superintendents theoretically report direct to the president, who is assisted by a number of staff officers of whom the most important is the vice-president in charge of operation. Practically it happens that most questions are referred to the president through the vice-president in charge of operation or, as he is called in India, the chief operating superintendent, who, in addition to other officers, has under him a staff officer for engine running and the supervision of work in roundhouses, the chief mechanical engineer, being responsible for all work done in shops. The chief engineer is responsible for the maintenance of permanent way as well as for new construction in so far as it concerns new work on the existing system, but there is as a rule a separate engineer-in-chief for the construction of new lines. The traffic department, the stores department, the "watch and ward" department which corresponds to the police department in America, and the electrical department are organized departmentally. Signaling comes under the chief engineer and as far as accounts are concerned there is a divisional accounts officer attached to each division. Such an organization is found to suit Indian conditions.

Record Traffic in Argentina

By Alexander V. Dye
U. S. Commercial Attaché, Buenos Aires

THE Argentine railways profited during the fiscal year, ended June 30, 1927, by the record-breaking volume of crop movement which has taken place in that republic.

During the first nine months of the year exports from the country have amounted to about 15,000,000 metric tons as compared to 9,000,000 metric tons the previous year. During the first six months of the year there was an increase of about 65 per cent in tonnage with an increase of about 25 per cent in value over the previous year. The difference between the tonnage and value increase being due to the lower prices which were received for this year's crop. Consequently the price of shares of the British-owned railroads in Argentina have been appreciating rapidly on the London Stock Exchange and have reached the highest level since before the war.

The Argentine railways spread out in fan shape from the port of Buenos Aires with smaller radial lines stretching out like fingers from the ports of Rosario and Santa Fé.

Nearly all of the railroads are chiefly occupied with bringing materials from the back country to the sea and river ports, specially to Buenos Aires. The principal materials carried are agricultural products, especially wheat, linseed, oats, barley and lumber. The fact that profits were not even larger is due to the difficulty in securing a back haul from the ports as most of the railways do not have any very definite terminus at the other end, merely stopping in the back country where the traffic ceases to exist. About 50 per cent of the total tonnage carried yearly consists of the cereals—wheat, corn, linseed and oats.

It is an indication of the prosperity of the railroads that at the close of 1926 only two of them showed operating losses for the calendar year.

Yearly dividends on the ordinary shares of the British owned railways were as follows for the year 1925-26, in pounds sterling per share:

Great Southern	8
Central Argentine	6
Buenos Aires and Pacific	7
Western	7
Cordoba Central	2
Entre Rios	6

The prices of ordinary shares of these railroads comparing them on June, 1927, with June, 1926, are as follows:

	1926	1927 June
Great Southern	95½	107¼
Central Argentine	73¼	88
Buenos Aires and Pacific	85¾	92¾
Western	84	89¾
Cordoba Central	32¾	37½
Entre Rios	42¼	66½

Argentine railways are virtually exempt from all forms of taxation except one which is a federal tax of 3 per cent of the net receipts based on a 60 per cent operating ratio.

The Minister of Public Works of the Argentine has just rendered his report for the year June, 1926, to May, 1927, from which the following information may be gathered in regard to the operation of Argentine railways during the past year. New capital invested in the railways during the year amounted to 59,951,709 silver pesos or about $25,000,000 U. S. currency. This new investment went into the building of additional mileage and in improvements in the quality of the rolling-stock.

Prince of Wales' Train on the Buenos Aires Southern

A total of 98 miles of new line was added during the year, bringing the total length of line in the republic up to 22,550 miles controlled by the national government and private railways. Of this amount 4,350 miles are owned and operated by the state and 18,200 miles operated by private companies. Including 1,190 miles operated by the provinces and subsidiary lines, this reaches a grand total of 23,740 miles of railway in the republic.

The operating figures for the year show that 145,000,000 passengers were carried, or 5,000,000 more than in the previous year, and 45,000,000 metric tons of freight, or about 3,000,000 more than in the previous year, were hauled.

Generally speaking, with the new investment of nearly $25,000,000 this year, the amount estimated to be invested in railways in the republic is approximately $1,600,000,000.

As a whole the results for the year were financially profitable. Income amounted to about $262,000,000, or some $12,000,000 more than the previous year. Expenses amounted to $185,000,000 or $6,000,000 more than the previous year, consequently net increased from $71,000,000 in the previous year to about $77,000,000 for the present year, which represents an increase of 8.4 per cent.

It should be said that there is a difference of opinion between the government as represented by the Minister of Public Works and the railway companies as to the financial operations of the year. These differences are shown in the following table:

COMPARATIVE RESULTS
(Peso 42.4 Cents)

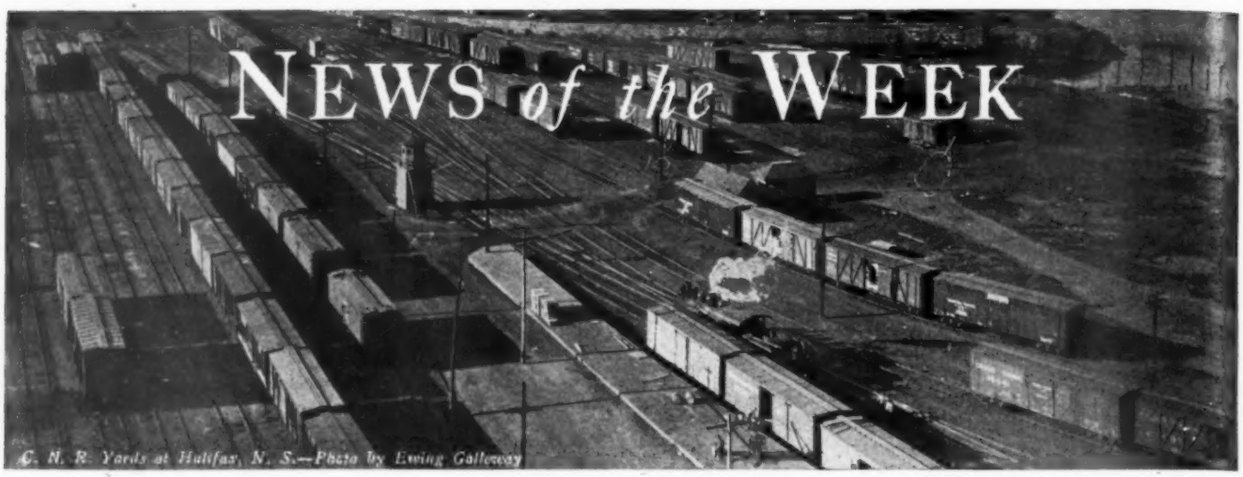
	Income Pesos	Expenses Pesos	Net Pesos	3% Tax Pesos
According to the government	543,330,789	362,951,742	180,379,047	5,542,664
According to the railways	536,583,720	365,392,056	171,191,664	5,117,850
Increase according to govt.	6,747,069	.....	9,187,383	424,814
Decrease according to the rys.	.....	2,440,314	.....	.....

At the close of the year there were 6,901 miles or 30.6 per cent of narrow gage lines, 1,769 miles or 7.85 per cent of standard gage lines and 13,880 miles or 61.55 per cent of broad gage.

The rolling-stock for the railways was improved during the year, not so much by the increased number of cars as by the substitution of larger cars for the cars which were replaced. The total amount of rolling-stock in operation on the Argentine railways at the close of the year was as follows:

4,026 locomotives with a total tractive power of 29,870,244 kilograms (1 kg. = 2.2046 lb.)
3,577 coaches with a total of 200,297 seats and 14,352 berths.
3,060 express cars with a total capacity of 47,595 metric tons.
81,177 freight cars with a total capacity of 2,209,452 metric tons.

NEWS of the WEEK



C. N. R. Yards at Halifax, N. S.—Photo by Ewing Galloway

COMMISSIONER JOHNSTON B. CAMPBELL has been elected chairman of the Interstate Commerce Commission for 1928, succeeding Commissioner Esch.

Safety Council News

The Chicago Great Western, for the first 11 months of 1927, recorded casualties to its employees at the low rate of 4.3 per million man-hours. In the car shops of the Wabash, at Decatur, Ill., 600 men have gone 13 months without having a reportable injury, and during the last three months not a minute's time has been lost on account of any accident. These and other bits of safety news are contained in the December news letter issued by C. F. Larson, secretary of the Steam Railroad Section of the National Safety Council. The Chicago Great Western has never employed a paid safety man; the superintendent on each division is responsible for safety work and he holds his staff responsible in this, as in other features of their duties. Superintendents issue a daily bulletin, by telegraph, giving the number of days since there has been a reportable injury to an employee on the division; and copies of this bulletin are given to trainmen with train orders.

Equipment

Locomotives

THE SEABOARD LINE has ordered 25 six-wheel switching locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of December 31.

THE MOBILE & OHIO has ordered 8 six-wheel switching locomotives and 5 Mikado type locomotives from the American Locomotive Company. Inquiry for this equipment was reported in the *Railway Age* of December 17.

Freight Cars

THE CENTRAL OF GEORGIA is inquiring for 500 gondola cars.

THE TEXAS COMPANY has ordered 200 insulated 10,000-gallon tank cars from the American Car & Foundry Company. Inquiry for 300 cars was reported in the *Railway Age* of December 24.

THE MOBILE & OHIO has ordered 250 box cars and 200 flat cars from the Mount Vernon Car Manufacturing Company, and 250 gondola cars from the General American Car Company. Inquiry for this equipment was reported in the Railway Age of December 17.

Passenger Cars

THE MOBILE & OHIO has ordered 3 steel passenger coaches and 3 steel passenger coaches with partitions from the Bethlehem Steel Company. Inquiry for this equipment was reported in the Railway Age of December 17.

Iron and Steel

THE ST. LOUIS SOUTHWESTERN is inquiring for 15,000 tons of rails.

THE DENVER & SALT LAKE is inquiring for 500 tons of structural steel for a viaduct at Wolcott, Colo.

THE PACIFIC FRUIT EXPRESS is inquiring for 400 tons of structural steel for an ice plant at Fresno, Calif.

THE PERE MARQUETTE has ordered 1,000 tons of structural steel for grade crossing elimination work in Detroit from the American Bridge Company.

THE WESTERN PACIFIC has ordered 800 tons of structural steel for bridge work at San Francisco, Calif., from the United States Steel Products Company.

Machine Tools

THE DELAWARE, LACKAWANNA & WESTERN will issue inquiries early in January for about 40 miscellaneous machine tools to cost from $500 to $14,000 each.

Miscellaneous

THE NEW YORK CENTRAL is asking for bids on the construction of 4 flat floats, 10 gasoline hoist barges and 5 scows. The bids will be opened at the office of the purchasing agent, New York, on January 12. Separate bids are requested on each of the three items. The car floats will have a length of 260 feet with 40 ft. beam, they will be of the two-track type with capacity for 12 cars. The 10 gasoline hoist barges will have a length of 100 feet with 33 ft. beam and a hoisting capacity of 10 tons. The 5 scows will also have a length of 100 feet and a beam of 33 feet. Both the gasoline hoist barges and the scows will be built on the Ellis channel system of construction.

Signals

THE PERE MARQUETTE has ordered from the General Railway Signal Company, 10 locomotive equipments for automatic train control.

THE ST. LOUIS-SAN FRANCISCO has ordered from the Union Switch & Signal Company, a mechanical interlocking, 38 working levers, for Bridge Junction, Ark.

Financial

DELAWARE & HUDSON.—*Application to Lease B. R. & P. Denied.*—The Interstate Commerce Commission on December 29 announced its decision denying by a six to five vote this company's application for authority to acquire control by lease of the Buffalo, Rochester & Pittsburgh, which has been pending since July 16, 1926, and also its application to operate over a line of the Pennsylvania from Buttonwood to Dubois, Pa., connecting the two lines. Commissioners Meyer, Esch, Aitchison, Eastman and Taylor dissented, and Commissioners Lewis and Woodlock, in concurring opinions, took the position that the commission should consider the proposal in connection with the general problem of the grouping of the eastern railroads. The majority report says that upon the record presented the applicant has not established its claim that the acquisition would be in the public interest but as an additional reason referred to the general problem of proper disposition of these roads incident to the grouping of lines in trunk line territory. "While we believe that these roads might advantageously form parts of a larger system connecting the Atlantic seaboard with the Great Lakes or the Mississippi Valley," the report says, "the present record is not sufficiently comprehensive to warrant the practically permanent assignment of such important lines as parts of the same system."

ERIE.—*Valuation.*—The Interstate Commerce Commission has denied a petition on behalf of this company and subsidiaries requesting information supplemental to the commission's tentative valuations.

Supply Trade

John Van Horne, representative of the **Lincoln Electric Company** with headquarters at Atlanta, Ga., has been transferred to Moline, Ill.

F. Baackes, vice-president and general sales agent of the **American Steel & Wire Company,** Chicago, has been elected senior vice-president. **D. A. Merriman,** assistant general sales agent, has been promoted to general manager of sales. **L. J. Gray,** assistant superintendent of mills, has been promoted to assistant to the president.

The Radio Electric Clock Corporation, on January 4 will open its new plant at Linden, N. J. The Corporation's products consist of a master clock corrected daily by radio from Washington as well as a complete line of secondary apparatus including various styles of secondary clocks, time stamps, time recorders and similar apparatus. It is said that this system is the only one in the world using radio signals to regulate its time system. The offices of the company are in the Hudson Terminal building, New York City. **Fred H. Ottley** is plant superintendent, **Prof. L. A. Hazeltine** is the radio engineer and **H. M. McSweeney** chief engineer for the company.

Charles W. Bell, who has been appointed general sales manager of the **Gould Storage Battery Company, Inc.,** with headquarters at Depew, N. Y., was born on August 24, 1884 at Picolata, Fla. He was educated in England and France, and also took an electrical engineering course at City and Guilds Engineering College, London, England. In 1905 he returned to America and served as chief engineer of the Key West Electrical Company and later with the Tampa Electric Company and the Keystone Telephone Company, Philadelphia. In March, 1907, he entered the service of the Electric Storage Battery Company, Philadelphia, as construction engineer, attached to its New York office and served consecutively in its main, construction and engineering departments at New York, Philadelphia, Cleveland and Chicago. In 1913 he entered the sales department and was sent to Atlanta, and in 1920 was appointed manager at that city. In September, 1925, he left the employ of that company. In January, 1927, Mr. Bell went to the Gould Storage Battery Company, Inc., as assistant manager of sales, engineering department, and now becomes general sales manager. **L. C. Hensel,** who has been appointed manager of railway sales of the Gould Storage Battery Company, with headquarters at New York, was born on December 12, 1878 at Port Jervis, N. Y., was educated at Hawley, Pa., and at Wyoming Seminary, Kingston, Pa. He was employed as construction electrician by the Lackawanna Steel Company at Buffalo, N. Y., during 1901 and 1902 and his first railway work was on the St. Louis-San Francisco as an electrical foreman, in July, 1903. Five years later he was promoted to electrical engineer and continued in that capacity until 1917 when he left that company to become plant superintendent for the Gould Storage Battery Company. In May, 1918, he returned to the St. Louis-San Francisco as electrical engineer, remaining in that position until May, 1924, when he resigned to become chief electrician of the Chicago & Alton, at Bloomington, Ill. A year later he left the Alton to serve as sales representative for the Edison Storage Battery Company, early in 1927 was appointed sales engineer for the Gould Car Lighting Corporation and now becomes manager of railway sales of the Gould Storage Battery Company.

L. C. Hensel

Officers

W. H. Edmonds has been appointed electrical engineer of the Colorado & Southern, with headquarters at Denver, Colo.

Samuel Porcher, assistant vice-president of the Pennsylvania in charge of purchases, stores and insurance, with headquarters at Philadelphia, retired under the pension rules on December 31.

Richard Hackett, who resigned on December 31 as Western freight traffic manager of the New York, New Haven & Hartford, with headquarters at Chicago, has been elected vice-president of the Los Angeles Junction Railway and the Judson Forwarding Company and an officer of several companies controlled by those organizations with headquarters at Chicago.

Upon the termination of the receivership of the Chicago, **Milwaukee & St.** Paul through approval by the **Interstate** Commerce Commission of the reorganization plan, **Harry E. Byram,** now one of the receivers, will become chairman of the board of directors of the Chicago, Milwaukee, St. Paul & Pacific, according to an announcement made on December 29. **H. A. Scandrett,** vice-president of the Union Pacific at Omaha, has been selected as president of the reorganized company to take office at the same time.

W. D. Steele has been appointed auditor of freight accounts of the Seaboard Air Line, with headquarters at Portsmouth, Va., succeeding **W. A. Rooks,** deceased.

R. V. Fletcher, general solicitor of the Illinois Central, with headquarters at Chicago, has been elected general counsel with headquarters at the same point, succeeding **W. S. Horton,** who retired on December 31, at the age of 70 years, under the pension rules of the company. **Edward C. Craig,** general attorney, with headquarters at Chicago, has been promoted to general solicitor of the Northern and Western Lines, succeeding Mr. Fletcher. The jurisdiction of **Charles N. Berch,** general solicitor of the Yazoo & Mississippi Valley, with headquarters at Memphis, Tenn., has been extended to cover the Southern lines of the Illinois Central and the Gulf & Ship Island. **H. D. Minor,** general attorney of the Y. & M. V., with headquarters at Memphis, has been appointed general attorney of the Southern lines of the Illinois Central and the Y. & M. V. and the G. & S. I. **T. J. Wells,** general attorney of the G. & S. I., has been appointed district attorney of that railroad with headquarters at Hattiesburg, Miss. **C. H. McKay** has been appointed assistant general attorney of the Southern lines of Illinois Central, with headquarters at Memphis.

Arthur H. Slader, who has been appointed assistant general manager (personnel) of the Boston & Maine, with headquarters at Boston, Mass., was born on October 11, 1878, at Chicago, and was educated in the public schools of Boston. He entered railway service in April, 1891, with the Old Colony (now a part of the New York, New Haven & Hartford). From July 1, 1893, at which time the Old Colony was leased to the New Haven, until February 1, 1905, Mr. Slader held various clerical positions on the New Haven. At the latter time he became superintendent's chief clerk, occupying this position on various divisions until December 1, 1909. From that time until February 10, 1913, he was chief clerk to the general superintendent. On February 10, 1913, Mr. Slader entered the service of the Boston & Maine as chief clerk to the general manager, remaining in this position until September 1, 1917. From that date until August 1 of this year, he has served consecutively as assistant to the general manager, assistant to the federal manager and assistant to the vice-president and general manager. Since August 1 he has been assistant to the president, which position he was holding at the time of his recent appointment as assistant general manager (personnel).

H. C. Mann, assistant chief engineer of the Union Pacific, with headquarters at Omaha, Neb., has been promoted to chief engineer, succeeding **R. L. Hunt-**

ley, who will retire under the pension rules of the company on January 1. **G. J. Adamson,** division engineer at Green River, Wyo., has been promoted to succeed Mr. Mann as assistant chief engineer. Mr. Adamson will in turn be replaced as division engineer by **J. R. Ellis,** assistant engineer at Omaha.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, 165 Broadway, New York City. Annual convention, May 1-4, 1928, Detroit, Mich. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Charles R. Busch, Buffalo Brake Beam Co., 32 Nassau St., New York. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—J. D. Gowin, 112 W. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next meeting, April, 1928, Biloxi, Miss.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Annual convention, June 12-15, 1928, Memphis, Tenn.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. M. Jones, supt. of sleeping and dining cars, C. M. & St. P., Chicago. Annual meeting, 1928, Havana, Cuba.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 292 Madison Ave., New York.

AMERICAN RAILROAD MASTER TINNERS' COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating—J. C. Caviston, 30 Vesey St., New York.

Freight Station Section (including former activities of American Association of Freight Agents)—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association)—J. C. Caviston, 30 Vesey St., New York.

Safety Section.—J. C. Caviston, 30 Vesey St., New York. Annual meeting, May 16 and 17, 1928, Buffalo, N. Y.

Telegraph and Telephone Section (including former activities of the Association of Railroad Telegraph Superintendents)—W. A. Fairbanks, 30 Vesey St., New York. Next meeting, Sept. 18-20, 1928, San Francisco.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago.

Division III.—Traffic. J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering. E. H. Fritch, 431 South Dearborn St., Chicago. Ill. Annual meeting, March 6-8, 1928, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch.

Electrical Section—E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York. Annual meeting, March 5 and 6, 1928, Stevens Hotel, Chicago.

Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual convention, June 20-27, 1928, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago.

Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell. 30 Vesey St., New York. N. Y. Annual meeting, June 20-22, Atlantic City, N. J.

Division VII.—Freight Claims. (including former activities of the Freight Claims Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill. Annual meeting, June 5-8, 1928, Detroit, Mich.

Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

Motor Transport Division.—A. P. Russell, temporary chairman, South Station, Boston, Mass. Next meeting, Jan. 25-26, Palmer House, Chicago.

AMERICAN RAILROAD BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Ky., 319 N. Waller Ave., Chicago. Annual convention, 1928, Boston. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION, R. R. Walker, agricultural agent, M-K-T Railroad, Dallas, Tex. Annual convention, May, 1928, Miami, Fla.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV). E. H. Fritch, 431 South Dearborn St., Chicago. Annual meeting, March 6-8, 1928, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. & St. P. Ry., 11402 Calumet Ave., Chicago. Annual convention, August 29-31, 1928, Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—Secretary: E. H. Lunde, Federal Machinery Sales Co., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, 1319-21 F St., N. W., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, Associate Mechanical Editor, *Railway Age,* 30 Church St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—E. J. Stocking, 111 West Washington St., Chicago. Next annual convention, Jan. 24-26, 1928, Mount Royal Hotel, Montreal, Que.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Next meeting, June, 1928, Omaha, Neb.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 413, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th and H. Sts., N. W., Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—C. F. Weil, American Brake Shoe & Fdy. Co., 332 So. Michigan Ave., Chicago. Meets with International Railway General Foremen's Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—W. D. Waugh, Detroit Graphite Co., St. Louis, Mo. Annual exhibit at convention of American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charron St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—R. E. Giger, 731 North 23rd St., East St. Louis, Ill. Meetings, first Tuseday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—(See Railway Car Department Officers' Association.)

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 811 Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, except July, August, September, Hotel Hollenden, Cleveland.

INTERNATIONAL RAILROAD MASTERS BLACKSMITHS' ASSOCIATION.—W. J. Maver, Michigan Central R. R., Detroit, Mich. Annual convention, August 21-23, 1928. Hotel Sherman, Chicago. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—W. W. Criley, Ajax Mfg. Co., Cleveland, O.

INTERNATIONAL RAILROAD FUEL ASSOCIATION.—L. G. Plant, 80 E. Jackson Blvd., Chicago. Annual convention, May 7-11, 1928, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Annual convention, September 4-7, 1928, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—W. J. Dickinson, 189 W. Madison St., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Annual meeting, May 22-25, 1928, Cleveland, O.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—E. A. Morse, vice-president, Potosi Tie & Lumber Co., St. Louis, Mo. Next annual convention, April 24-26, 1928, Arlington Hotel, Hot Springs, Ark.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual convention, September, 1928, Glacier National Park, Mont.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention, March 5-8, 1928, Coliseum, Chicago.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: C. F. Larson, supt. of safety, Missouri Pacific, St. Louis, Mo.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Annual dinner, December 15, Hotel Commodore, New York. Regular meetings, 3rd Friday in month, except June, July and August.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2nd Thursday, in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 116 Woodward Building, Washington, D. C. Next convention, May 1-4, 1928, Atlanta, Ga.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1406 Packard Bldg., Philadelphia, Pa.

RAILWAY CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago. Supply Men's Association.—B. S. Johnson, W. H. Miner, Inc., 209 S. La Salle St., Chicago.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton, St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—C. C. Marlor, 208 W. Washington St., Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division and Purchases and Stores Division, A. R. A.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual convention, September, 1928, Detroit, Mich. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A., Signal Section.

SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—Clyde Kimball, Inman Shops, Atlanta, Ga. Meets semi-annually.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & A. Ry., Atlanta, Ga.

TRACK SUPPLY ASSOCIATION.—A. H. Todd, Positive Rail Anchor Co., 80 E. Jackson Blvd., Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, Gen. Supt. R. S., New York Central, Buffalo, N. Y. Annual convention, October, 1928, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 189 West Madison St., Chicago. Regular meetings, 3rd Monday each month, except June, July and August.